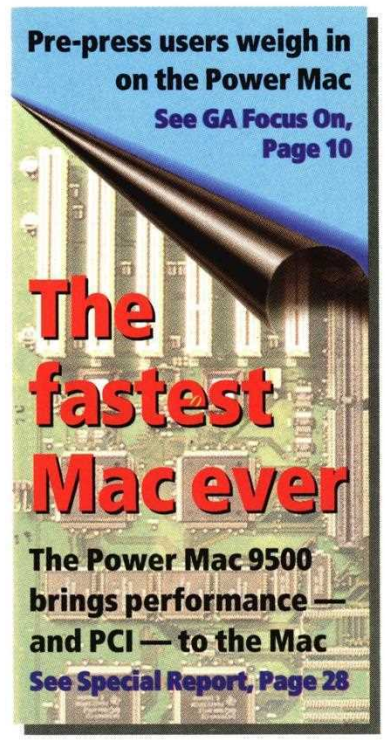
MacWEEK

06.19.95 *The Newsweekly for Macintosh Managers* VOLUME 9 NUMBER 25


Pre-press users weigh in on the Power Mac
See GA Focus On, Page 10
The fastest Mac ever
The Power Mac 9500 brings performance — and PCI — to the Mac
See Special Report, Page 28

Fast Ethernet outpaces Open Transport on PCI

By Clifford Colby

In tandem with this week's release of the Power Mac 9500, networking vendors will debut the first PCI-based Fast Ethernet cards for the Mac. Apple, however, is cautioning those hoping to exploit the 9500's faster LAN links that they will have to wait until year-end while it prepares Open Transport 1.1.

Although several companies will ship 100-Mbps Fast Ethernet Mac PCI cards this week, Open Transport, Apple's new networking software required for the PCI cards, is not tuned for speeds faster than 10-Mbps Ethernet.

Garry Hornbuckle, Apple product manager of communications and collaboration technologies, said Version 1.0 of Open Transport is optimized for AppleTalk and TCP/IP running at the 10-Mbps speed of standard Ethernet. According to Hornbuckle, the goal for Version 1.0 was to completely rewrite the Mac's communications architecture while ensuring full backward compatibility with existing applications.

"Since 10-Mbps Ethernet is built into the CPU, we first focused on that," he said. "And [the speed] we are seeing is quite good, especially with TCP/IP." Version 1.1 of Open Transport, due by the end of the year, will be tuned for better performance over speedier data

See Fast Ethernet, Page 88

Tsunami strikes 604 beachhead

New printers join PCI Mac rollout

By David Morgenstern

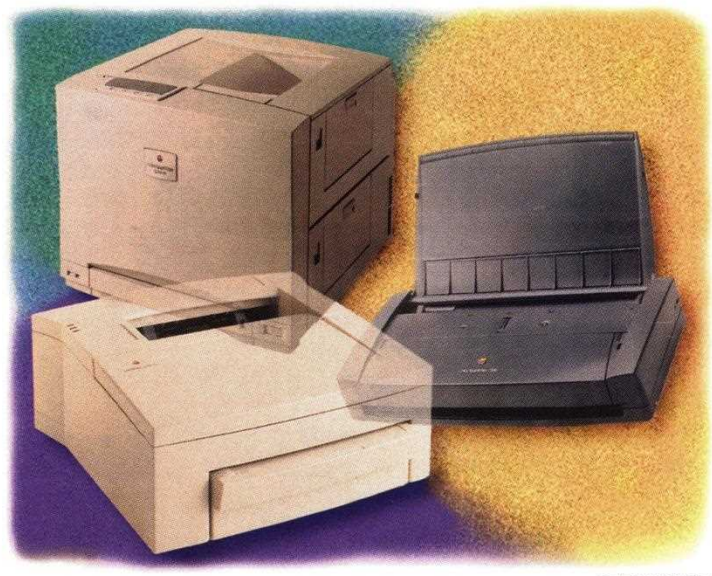
While the first PCI Macs take center stage at Apple's product rollout this week, the new CPUs share the spotlight with a supporting cast of output devices.

The star attraction is the Power Mac 9500, running the PowerPC 604 processor and available in two configurations for pre-press and digital-video applications (see story, Page 28).

A 120-MHz model with a 1-Gbyte hard drive and video card costs $4,999. A higher-performance version, the 9500/132, which sports a 2-Gbyte drive but no display card, is $5,799. Both models come standard with 16 Mbytes of RAM and a quadruple-speed CD-ROM drive.

"The 9500's a pretty cool box; everyone here wants one," said beta user Steven Erde, director of academic computing with the Cornell University Medical College in New York, which is evaluating the 9500 for use in a large installation devoted to multimedia medical education. Erde said that while the high performance of PCI makes the 9500 a natural for digital video, it will also find its way into research. "It's the ultimate

See Tsunami, Page 86



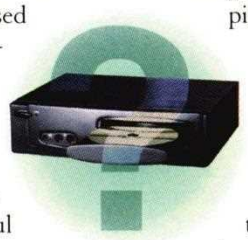
JOHN FARNSWORTH

Pippin faces delays

May not be home for Christmas '95

By Robert Hess

Apple may have bitten off more than it can chew with its Pippin home multimedia machine. The Macintosh-based project has lost key engineers, is months behind schedule and may not be completed in time to compete with a winter storm of powerful game machines.



Announced in December 1994 for a late 1995 delivery, Pippin will be a multimedia platform based on a subset of the new PCI Power Mac architecture (see MacWEEK, March 27, Page 4).

Apple is aiming Pippin at the home and educational markets and said the device will answer the consumer desire for a combination computer and game machine. Bandai Co. Ltd. of Tokyo, the first and only licensee of the design, said it plans to sell Pippin in Japan under the name Power Player for roughly $500.

Sources said that while the hardware portion of Pippin is essentially complete, the software component has endured a range of problems and is unlikely to ship by its New Year's Day deadline.

Four of the five Pippin software engineers reportedly left the

See Pippin, Page 86

NEWSMAKER

Don Strickland outlines Apple business pitch

By Mark Hall and Andrew Gore

Doing the impossible — that's the growing reputation of Don Strickland, the man credited with bulldozing through internal gridlock in Apple's efforts to license the Mac OS. Now Strickland is hoping to drive over another company roadblock: the stalled Mac market in business and government.

In the first public airing of his plans to regain business customers, Apple's vice president of worldwide business and government markets named top priorities, outlined new systems bundles for small business and workgroups, and hinted at a new color monitor still in development.

Strickland listed Apple's business markets as publishing, technical, mobile computing, business

See Strickland, Page 86

Color LaserWriter covers spectrum of business, DTP

By Rick LePage

REVIEW

The arrival today of Apple's first color laser printer, the Color LaserWriter 12/600 PS, is another sign that 1995 could be the breakthrough year for workgroup color printers, bringing color closer to the mainstream for business and general graphics users.

The $6,989 Color LaserWriter follows close on the heels of Tektronix Inc.'s $8,995 Phaser 540 color laser and $4,995 Phaser 340 solid inkjet, which were significantly better than the first round of color lasers (see MacWEEK, Feb. 13, Page 25). With the Color LaserWriter, Apple has produced a printer with image quality as good as the Phaser 540 at a much lower price.

The Color LaserWriter has a lot going for it right out of the box. For starters, it is based on a 600-dpi Canon engine that prints three CMYK color pages per minute, monochrome pages at 12 pages per minute and color transparencies at 1 ppm. The printer's PostScript

See LaserWriter, Page 41

NEWSPAPER SECOND CLASS

See The Future Of Storage.

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The Tahoe 230 MB is the world's first portable optical drive, weighing only 1.8 lbs. It offers quick access time and fast data throughput, with each rewritable 3.5"disk storing 230 MB of data. With its optional travel case and battery pack, the Tahoe is the perfect solution for users on the go. *$795*

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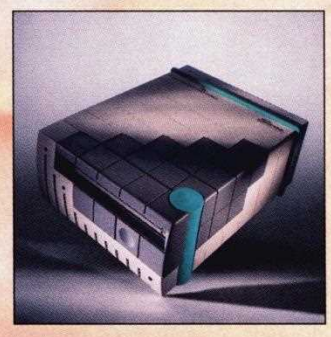

The Sierra 1.3 GB is the industry's fastest optical drive. It can be used as both a hard disk replacement and an on-line archiving system. Each 5.25" cartridge holds 1.3 Gigabytes of data, and boasts a 30-year shelf life. It is ideal for data-intensive applications such as graphics, CAD/CAM, multimedia or data archiving. *$2,495*

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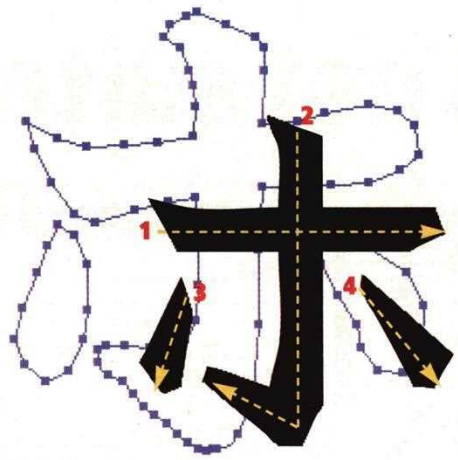
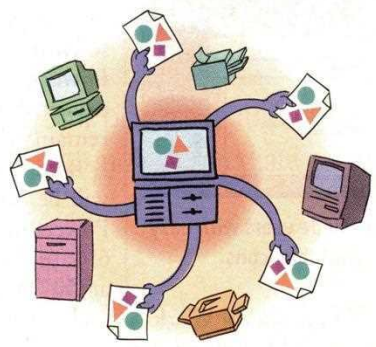


Copland will expand the capabilities of foreign-language systems with better font display, storage and a more powerful translation engine. See Gateways, Page 16.



Publishing users looking for ways to streamline the production process can choose from several new pre-press networking products. See GA, Page 10.

AppleShare 4.1 and the PPC-based WS 9150 provide a significant speed boost even if software isn't native. See Reviews, Page 41.

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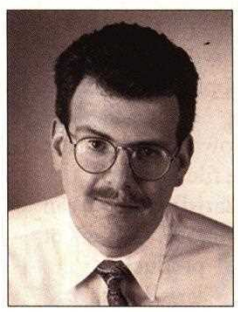
MACWEEK INSIDER ANDREW GORE

The haunting of Pippin

You know, when I started writing this column, I had in mind an analysis of the merits of Pippin as a game machine, which I though were few. However, after spending an hour discussing this opinion with Apple, I have to admit that I now have absolutely no idea what Pippin is.

It sounds like the plot of a frightening, not to mention unusually original, Stephen King novel. The ghost of John Sculley is back, haunting the corridors of Apple's newly minted R&D division. His spirit cannot rest until it resolves his lifelong quest to build a product that helps mankind reach a new plateau in its moral, cultural and technological evolution.



After many months of searching, Sculley's ghost finds only projects born of Apple's new pragmatism — that boring core Mac business stuff. But, just when the former CEO is about to give up, he notices a little box called Pippin, and a smile breaks over his cadaverous face.

Those of us who lived through the Newton debut can remember how Sculley proclaimed that the PDA would help us reach a state of bliss that would make the crew of the Enterprise look like a bunch of gin-swilling misanthropes. Newton wasn't just an organizer; it was something totally new — an electronic genie that fit in the palm of your hand. With such nebulous, digital-convergence gobbledygook for a definition, it was no wonder no one knew what the hell they would use a Newton for.

Pippin, I was told, is also something new. It's not a game machine, although it runs games. It's not a personal computer, although it will be able to run Macintosh software; have a keyboard attached to it; and connect to printers, modems and external storage devices. Pippin is a machine for the millions of households that either can't afford or are afraid of computers but still want to reap the benefits of a digital education.

It's probably just as well Apple doesn't think of Pippin, with its projected $500 price tag, as a game machine. Because the likes of Sony Corp. with its $299 PlayStation, fresh from a million-plus sales in Japan, would have eaten Pippin alive like the Tokyo citizenry in a Godzilla movie. And that doesn't factor in Sega Saturn, Nintendo Ultra 64 or 3DO M2, all of which will be less expensive, have better graphics and stronger support in the retail channel.

It's just as well Apple doesn't think of Pippin as a game machine.

So the question that remains is, with so much eye candy vying for the average consumer's limited budget (and no one's going to convince me that the average consumer is going to buy both a Pippin and a game console), does Pippin have a chance?

I really don't know. Apple and Bandai Co. Ltd., the company building the first Pippin, are betting on a market whose existence has yet to be proven. Will people think that the Mac-distilled console is enough of a computer to forgo the purchase of a PC? Will they consider it superior to a Sega because of all the education content that will run on it? Apple argues that there will be lots of content for Pippin because if you develop for Pippin, you get the Mac free. Of course, Apple is having enough trouble convincing developers that they should build for the Mac, so I'm not sure how Pippin will sweeten that deal.

The rest of Apple is focused on solutions-oriented marketing, which shows that a lot of people in Cupertino have their eye on building the Mac's brand equity in real, corporeal markets. However, if Pippin gets the same cold reception that Newton got, it could do some damage to that brand equity Apple is rebuilding.

In the long run, things turned out OK with Newton, once Apple figured out that it was indeed an electronic organizer, and things may be just fine with Pippin. But with so many more pressing issues haunting it like poltergeists, Apple may want to think twice before going down into another dark, drafty basement with only a single candle for light. □

Andrew Gore is executive editor/news at MacWEEK. He welcomes feedback at Andy_Gore@macweek.ziff.com.

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Saber hones net suite

Version 2.0 adds icon menuing

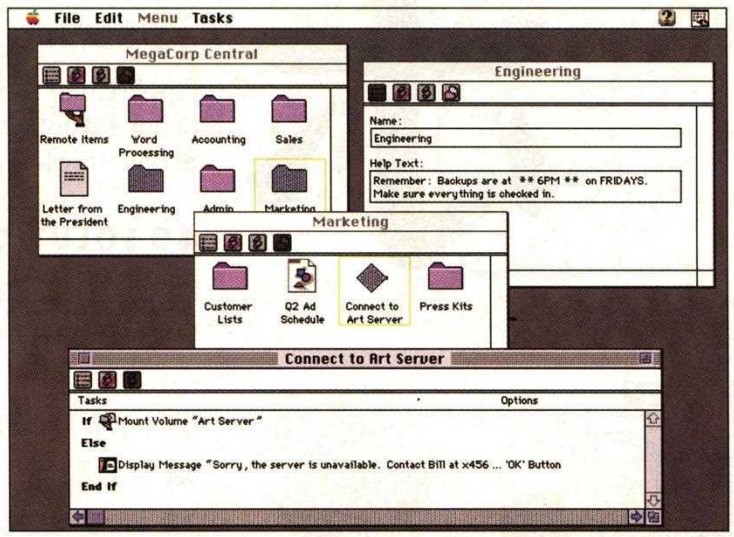
By Nathalie Welch

Capitalizing on software it purchased from Technology Works Inc. last year, Saber Software Corp. this month will update its asset-management suite for Mac networks.

Saber LAN Workstation for Mac OS 2.0 will cost $199 for one node, and each additional node will be $49. The package includes two software components previously sold as part of Tech Works' GraceLAN suite of products — the Update Manager, now called Software Distribution, and the Network Manager.

The update also includes Desktop Manager, a Mac version of Saber's Intel-standard PC application for creating scripted icon sets that automate access to network services or applications. Administrators can distribute the preconfigured sets to users' desktops or make them available on a server.

The Software Distribution component has been rewritten to handle more-complex installation procedures via an expanded scripting facility that understands conditional "if-then" statements. A new server function lets administrators create a single software update package and download it to multiple servers that eventually pass the software items to individual users.



Saber LAN Workstation 2.0's Desktop Manager can provide users with easy access to network services via centrally controlled, scriptable icons.

Saber LAN Responder, a control panel that handles communications among the other three components, is now Power Macnative. The Network Manager component, which gathers information on Macs and SNMP (Simple Network Management Protocol) devices, remains unchanged.

Owners of Saber LAN Workstation for Mac OS 1.0 or the original GraceLAN package can upgrade to Version 2.0 with savings of up to 80 percent, depending on quantity and time of purchase.

Last month, Santa Clara, Calif.-based McAfee Associates Inc. signed an agreement to purchase Saber, which will start doing business under that name in mid-July, Saber said.

Saber Software Corp. of Dallas is at (214) 361-8086 or (800) 338-8754; fax (214) 361-1882. □

DayStar resurrects PPC upgrade cards

By James Staten

DayStar Digital Inc. last week breathed life back into Apple's discontinued Power Mac Processor Upgrade cards and outfitted them with new capabilities.

The company announced that the PowerPC-based boards will re-emerge with new features and software as part of the DayStar PowerPro 601 line. The cards are expected to ship in July and will remain priced at $529 each.

Both original configurations will be offered. The 40/50 MHz PowerPro 601 supports the Centris 610 at 40 MHz and the Quadra 610 at 50 MHz, depending on the speed of the base machine's motherboard. The 50/66 MHz Power Pro 601 will support the Centris 650 and Quadra 700 and 900 at 50 MHz and the Quadra 650, 800 and 950 at 66 MHz.

Like DayStar's other PowerPro products, the new cards will include a 1-Mbyte secondary cache; System 7.5; and a control panel that lets users switch between the 68040 and PowerPC processor, toggle the cache on and off, and display a menu-bar icon that indicates which processor is in use. The cards will be covered by a three-year warranty.

DayStar Digital Inc. of Flowery Branch, Ga., can be reached at (404) 967-2077 or (800) 984-4510; fax (404) 967-3018; sales@daystar.com; http://www.daystar.com. □

Nikon preps slide scanners

By Donna Raskin

Nikon Inc. is warming up two new slide scanners for the desktop publishing and photo-archiving markets.

Available in mid-August, the $2,695 LS-1000, which the company has dubbed the Super CoolScan, will be based on the same cold-lamp LED CCD (charge-coupled device) technology as the company's CoolScan model. The new device will capture 36-bit color in a single pass — compared with 24 bits for its predecessor — and it will be able to capture a 2,700-dpi image in about 40 seconds, several times faster than the earlier model.

The LS-1000 will handle film measuring up to 24.3 by 36mm, and it will ship with a holder for film strips. Users will also be able to buy a 50-slide autofeeder for $685.

The LS-4500AF, due in September for $11,395, will scan a 4-by-5-inch transparency at 1,000 dpi in three minutes or a 35mm slide at 3,000 dpi in two minutes. The three-pass CCD will capture 12 bits each of RGB data per pixel.

Users will be able to rotate all media 360 degrees, Nikon said.

Both the LS-1000 and LS-4500AF will include SCSI-2 interfaces. In addition, both devices will ship with a new Adobe Photoshop plug-in and proprietary image-manipulation software that features gamma-curve editing, autofocus, resizable preview and zoom, and cropping capabilities.

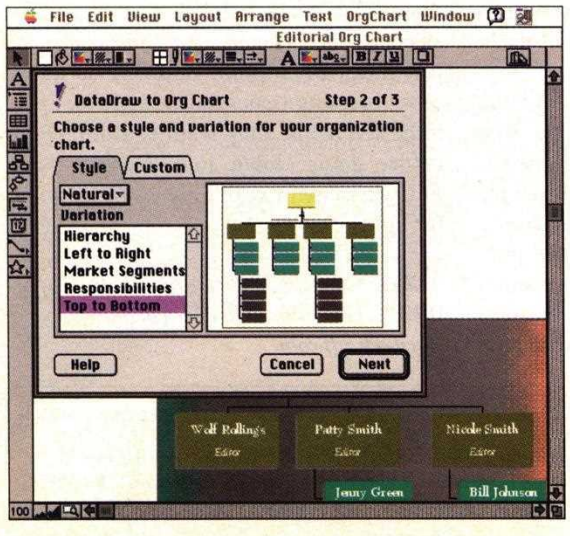
Nikon Inc. of Melville, N.Y., is at (516) 547-4355 or (800) 526-4566; fax (516) 547-0305. □

ClarisImpact 2.0 to draw on databases

By Cate C. Corcoran

Claris Corp. this week announced that a major upgrade to its ClarisImpact business graphics and presentation application, slated to ship in August, will automate creation of diagrams from spreadsheets and databases.

Version 2.0 of the application, which makes diagrams such as organizational charts, time lines and flowcharts, will broaden its offerings of preset graphics styles and included diagram symbols.



ClarisImpact 2.0's new DataDraw function will let users create diagrams automatically from databases or spreadsheets by choosing chart types and other attributes.

The price will be lowered to $129.

The most significant new feature in the upgrade will be DataDraw, which will create diagrams from tab- or comma-delimited information in a text file made from a spreadsheet or database. When used with applications that support Apple events, ClarisImpact will maintain a link with the text document, updating the Impact document as changes are made to the text file. Templates specifically for automating translation from Microsoft Excel spreadsheets and Claris' FileMaker Pro databases will be included.

Rather than the drag-and-drop metaphor many diagramming applications use, ClarisImpact lets users begin with a menu of preset graphical styles to choose from and modify before the graphic is placed into a document.

The upgrade will add a host of presentation functions, such as speaker's notes, a "light table" for arranging slides, an outliner and background templates. Version 2.0 will include more than 50 transitional effects for presentations.

The company said more than 150 statistical and mathematical functions will be added to the program's table capabilities.

Version 2.0 will be a native Power Mac application and is slated to ship simultaneously with a Windows version that shares the same file format.

Owners of ClarisImpact 1.0 can upgrade to 2.0 for $59. Owners of other graphics products, FileMaker Pro or ClarisWorks can buy the application for $69.

Claris Corp. of Santa Clara, Calif., can be reached at (408) 727-8227 or (800) 544-8554; info@claris.com. □

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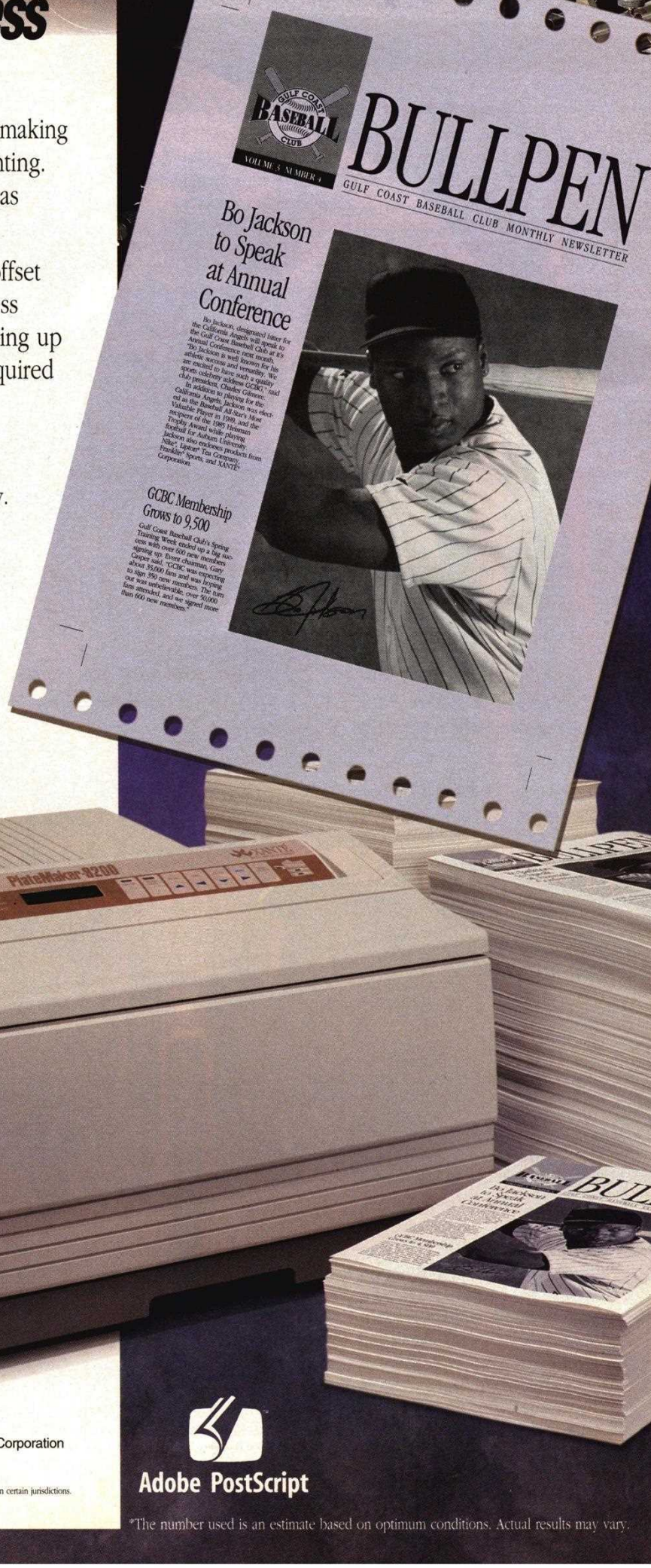
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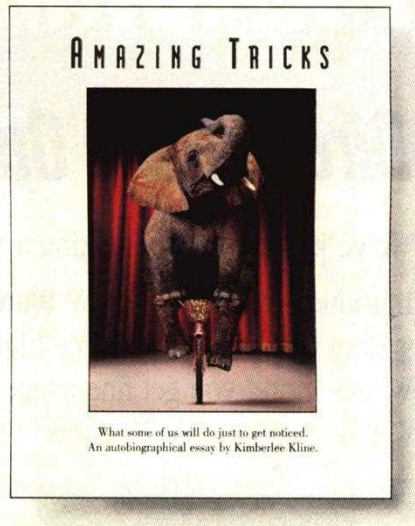
*The number used is an estimate based on optimum conditions. Actual results may vary.

Tiny had the hard part. Scanning it was easy.



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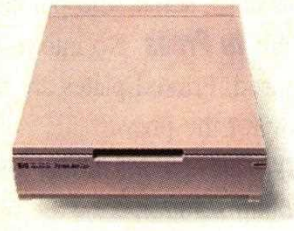

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FWB, DPT pump up SCSI on PCI

Boards to run on Power Mac 9500

By David Morgenstern

FWB Inc. and Mac newcomer Distributed Processing Technology Corp. laid their PCI cards on the table this week when they delivered new SCSI accelerators and RAID boards for Apple's new Power Mac 9500.

FWB shipped its PCI SCSI JackHammer card. The Fast and Wide SCSI-2 board uses a 40-MHz RISC processor and costs $499. To demonstrate the capabilities of the new card, FWB showed a PCI RAID system comprising a pair of PCI SCSI JackHammers, the company's RAID ToolKit 1.7.5 software and two of its dual-drive external arrays. The striped system offered a sustained data transfer rate of 31.4 and 23.5 Mbytes per second, respectively, for reads and writes, twice as fast as its current NuBus counterparts.

FWB said users of its SCSI NuBus cards as well as competing boards can upgrade to a PCI version for $299; a RAID software-and-hardware upgrade is $499.

Entering the Mac market with a full lineup, DPT released SCSI accelerators and high-performance card-based RAID controllers.

Based on DPT's SmartCache III designs for Intel-standard PCs, the $395 PM2024-Mac and $595 PM2124-Mac provide a Fast SCSI-2 interface; a Fast and Wide model, the PM2124W-Mac, is $695. The entry-level model uses a 16-MHz Motorola 68000 processor, and the other two employ 20-MHz 68020 chips.

The cards support up to 64 Mbytes of cache RAM via a $555 add-on module that DPT said uses sequential, elevator-sorted and scatter-gather algorithms to improve write performance. A $555 array module for the cards adds RAID levels 0, 1 and 5.

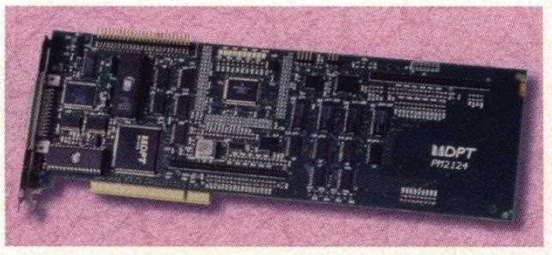
DPT also unleashed two Mac versions of its SmartRAID PCI array controller, the $1,795 Fast SCSI-2 PM3224-Mac and $1,995 Fast and Wide PM3224W-Mac. The boards run a 40-MHz 68030 processor and support RAID levels 0, 1 and 5.

The boards can hold up to 64 Mbytes of cache RAM, and users can add either one or two more SCSI channels by means of a daughterboard. The single and double Fast SCSI-2 expanders cost $395 and $595, respectively; the Fast and Wide one- and two-channel versions are $525 and $735, respectively.

All the cards will ship with DPT's own formatting and RAID utility.

FWB Inc. of Menlo Park, Calif., can be reached at (415) 325-4392; fax (415) 833-4655.

Distributed Processing Technology Corp. of Maitland, Fla., is at (407) 830-5522 or (800) 322-4378; fax (407) 260-5366. □



DPT's SmartCache III PCI card has a Fast SCSI-2 interface and accepts optional cache RAM and RAID daughtercards.

For the record

A story in the June 12 issue (Page 12) misstated the name of a forthcoming Macintosh version of a game from MacPlay, a division of Interplay. The correct name is Descent.

The June 12 story on Radius Inc.'s PrecisionView 21 monitor (Page 78) misidentified the manufacturer of the monitor's tube. The device is built around a Mitsubishi DiamondTron tube.

In a May 29 story on desktop publishing in Europe (Page 20), an incorrect reference was inserted into a quote. The quote actually referred to Indigo Ltd.'s E-Print 1000 digital press.

Novell releases viewer gratis for Envoy docs

By Cate C. Corcoran

Novell Inc. this month made an offer aimed at simplifying distribution of electronic files created with its Envoy portable document application.

The Envoy Distributable Viewer, an application that lets users view, annotate and highlight Envoy documents, is now available free. Users of Envoy's publishing component can embed the viewer into Envoy documents, letting recipients launch Envoy documents from a single executable file.

The Envoy Distributable Viewer for the Macintosh, Power Macintosh and Windows can be downloaded from Novell's World-Wide Web site at http://www.novell.com; CompuServe; or Spaceworks. Users can order the application on disk by calling (800) 444-6022.

Novell Inc. of Orem, Utah, can be reached at (801) 225-5000 or (800) 451-5151. □

ToDo recites daily tasks

By James Staten

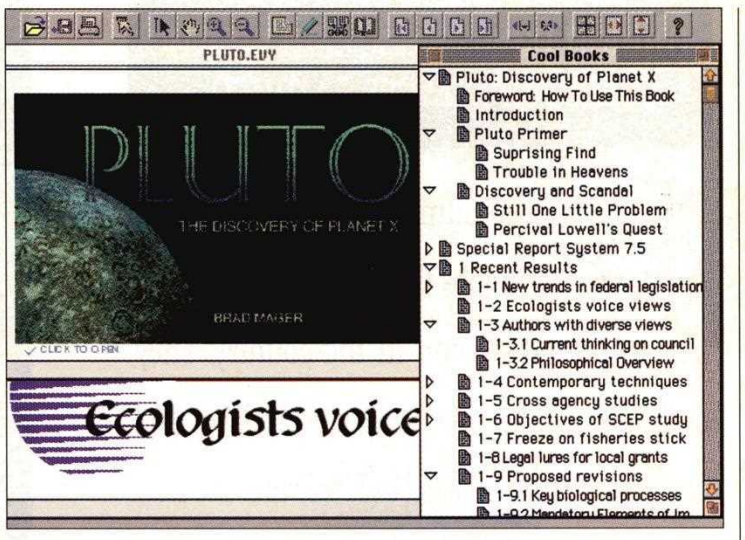
A new software package from LandWare Inc. is aimed at replacing both paper- and audio-based to-do-list-management systems.

ToDo List, priced at $23.95, is a stand-alone native Power Mac information manager that allows users to store both text and audio listings. Each item can include both audio and text elements, and each can be attached to a date and assigned a priority. In addition, Speech Manager support allows the software to pronounce all written messages.

Uncompleted items carry forward until they are accomplished; multiple lists can be open at the same time, and each item can contain descriptions up to 255 characters long, the company said.

The program supports AppleScript, Apple events and the Drag Manager. It also provides an autosave function as well as balloon, Apple Guide and on-line help.

LandWare Inc. of Budd Lake, N.J., can be reached at (201) 347-0031; fax (201) 347-0340; info@landware.com; http://www.planet.com/landware. □



Tumbleweed Publishing Essentials, a group of add-on tools for Envoy, will let users create hierarchical outlines of Envoy digital documents.

Tumbleweed sends Envoy to publishers

By Cate C. Corcoran

Tumbleweed Software Corp., developer of Novell Inc.'s Envoy portable-document application, has announced that it will develop and market a set of add-on tools aimed at desktop publishing users looking to adapt content with Envoy.

The $695 package, Tumbleweed Publishing Essentials, will add font handling, indexing, outlining and hypertext tools to Envoy and is slated to ship in late summer.

The main component of the package will be the Tumbleweed Publisher, a portable-document-creation program that performs batch conversion of PostScript, EPS and Adobe Acrobat's Portable Document Format files into the Envoy format. The Publisher will let users embed PostScript Type 1 and TrueType fonts into Envoy documents.

The Link Builder component will automate generation of hypertext links within and between Envoy documents. An Outline Builder tool will create hierarchical outlines of multiple documents based on user-defined templates.

The Rich Text Index Builder application in Tumbleweed Publishing Essentials will compile full-text indexes that incorporate both text and formatting information from Envoy documents.

The package will ship with Envoy Distributable Viewer, a royalty-free viewing application for Envoy documents (see story, above left). It will also include a 10-pack of Tumbleweed's Viewer Extensions, which will let users search indexes, access hypertext links and create slide shows from Envoy pages. Additional 50-user packs of the Viewer Extensions will be available for $395 each.

Tumbleweed Software Corp. of Redwood City, Calif., can be reached at (415) 363-7022; fax (415) 363-7024; twcorp@aol.com. □

MicroTouch to ship touchscreen kit

By James Staten

MicroTouch Systems Inc. this month will ship its first resistive touchscreen, a technology it acquired last month when it bought Touch Technology Inc.

The $595 MicroTouch Resistive Starter Kit contains a serial controller; a screen sensor for use with a 14-inch monitor; mounting hardware; and drivers for most OSes, including the Mac OS.

Unlike MicroTouch's capacitive touchscreens, which use surface acoustical waves to track finger position, this model has a plastic-on-glass membrane coated on its inside faces with a thin, conductive metal oxide. An electrode pattern printed along the edges of the sensor and a voltage field spread across the screen allow the unit to translate touches into on-screen coordinates. The screen is covered by a five-year warranty.

MicroTouch Systems Inc. of Methuen, Mass., can be reached at (508) 659-9000 or (800) 642-7686; fax (508) 659-9100; touch@mts.mhs.compuserve.com. □

Vince DiPaola takes a few million pages to explain why he likes our servers so much.

These days, Gamma One turns around more separation jobs than just about any 130-person pre-press shop in the country. They do it with talented people, high standards and one very impressive kind of hardware: the new Workgroup Servers from Apple.

Recently, Vince DiPaola, V.P. Technology at Gamma One, bought nine Workgroup Servers. He then added two critical pieces of software: Adobe™ Color Central, which lets users work with files in a low-resolution format—saving significant processing time when designing layouts, printing and sending files. And Canto Cumulus PowerPro software, which catalogues thousands of images, for quick, easy retrieval.

And because they're Apple® servers, says Vince, "We don't need a certified engineer on hand to maintain them. Our people do all the upgrades themselves around here."

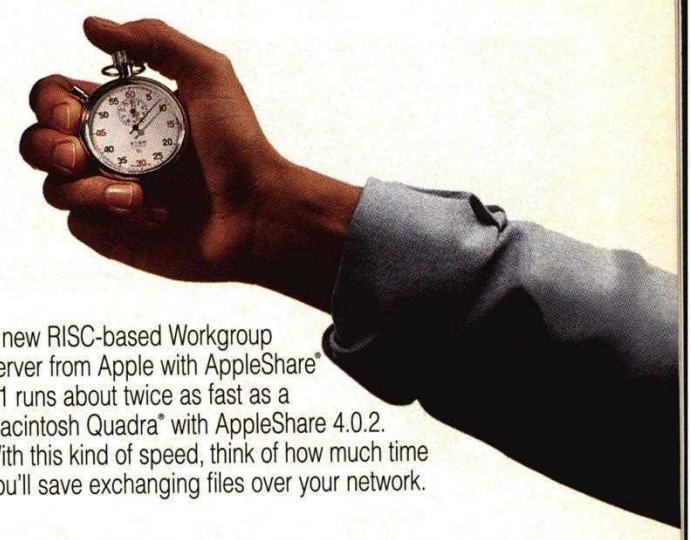
Of course, our Workgroup Servers can help your business discover a whole new power, too. The power to be more productive. The power to be more effective. The power to be your best.®

Vince DiPaola,
V.P. Technology, Gamma One,
North Haven, Connecticut.

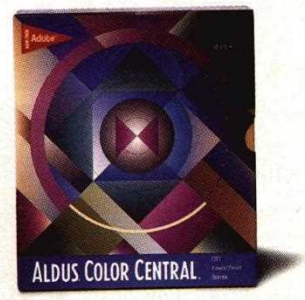
Gamma One is a color-separation house whose clients include Hanover Direct, Lord and Taylor, Clifford and Wills, Bloomingdale's and many, many, many, many more.

"The volume of work that moves through here is mind-bending. With so much going on, our people can't afford to waste time hunting for a photo on a SyQuest cartridge or waiting 25 minutes for a screen to clear. And there's never any excuse for a job being late. Or wrong. The truth is, with this much work, life without servers just isn't an option. These Workgroup Servers have been a major help in keeping us organized, efficient and sane. Well, organized and efficient, anyway."

–Vince DiPaola

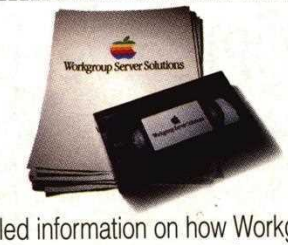


A new RISC-based Workgroup Server from Apple with AppleShare® 4.1 runs about twice as fast as a Macintosh Quadra® with AppleShare 4.0.2. With this kind of speed, think of how much time you'll save exchanging files over your network.



Adobe Color Central converts high-res images into low-res "sample files." So your people can crop, rotate, scale—and print—images in just seconds. Because the server does the bulk of the processing, your workstations don't have to.

Canto Cumulus stores and catalogues virtually thousands of images. So now your people can retrieve them quickly and easily—instead of having to spend their valuable time hunting through SyQuest cartridges, CDs and hard disks.



For detailed information on how Workgroup Servers can transform your business, call **1-800-538-9696** (ask for **ext. 930**) to receive our free *Workgroup Servers in Publishing* information kit.

Apple

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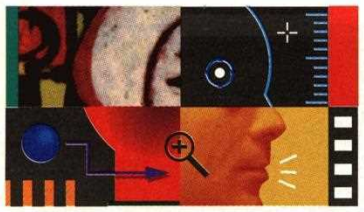


GA

TSUNAMI HITS DTP

"Publishing people are starving for speed; the 9500 motherboard is made for this type of power."

— Steve Zenger, president, IDIA

HSC effects add zing to illustration apps

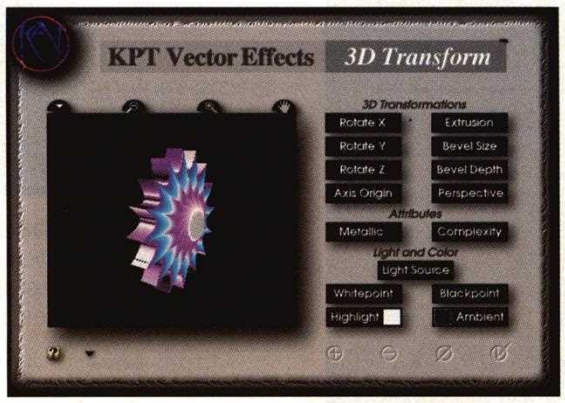
By Cate C. Corcoran

Users of Macromedia FreeHand 5.0 and Adobe Illustrator 5.5 can warp, distort, shadow and shatter their vector-based images with KPT Vector Effects, HSC Software Corp.'s package of extensions for those illustration applications.

Priced at $199, KPT Vector Effects adds filters and effects to Illustrator and FreeHand that extend control of the applications and provide new functionality.

Many of the Vector Effects filters apply effects that would be prohibitively time-consuming to do from scratch. KPT 3D Transform rotates selected objects along three axes, extrudes or bevels objects, and lets users control light sources. KPT Flare places a star of color on an object, which makes it look like a bright light shining on or through it.

KPT ColorTweak gives users real-time color controls, including brightness, contrast and color inversion. KPT Resize and Reposition provides one interface from which to scale and move objects.



The 3D Transforms filter in HSC's Illustrator and FreeHand plug-ins package lets users create images in 3-D, as well as adjust bevel size, depth and highlight colors.

KPT Shadowland places soft shadows behind or around objects and lets users adjust size, color and other shadow characteristics. Users can create the effect of broken glass with KPT Shatterbox, which allows adjustment of "impact" and the spread of broken pieces.

HSC said that KPT Vector Effects detects whether it is being used on top of Illustrator or FreeHand and retains key commands and attributes specific to each program, such as the color of selected handles.

HSC Software acquired the technology for KPT Vector Effects, previously called Sree's Cool Tools, from Intrepid Systems Inc. earlier this year (see MacWEEK, Jan. 23, Page 14).

HSC Software Corp. of Carpinteria, Calif., is at (805) 566-6200; fax (805) 566-6385; hscsales@aol.com. □

FOCUS ON PUBLISHING

Pre-press users rev up for new 9500 series

By Cate C. Corcoran

As Apple this week tries to launch its powerful new line of Macintoshes into the publishing market, pre-press users are considering whether the 9500 series' performance boosts will break through the gravitational pull of their existing technology investments.

The Power Macintosh 9500 series couples dramatic speed boosts with significant architectural and standards changes. It delivers up to 132 MHz of speed from the 604 chip, heralds the switch to the PCI bus, offers six expansion slots and revs connection speeds with internal Fast SCSI. While publishing users say that any speed increase is good news for them, many are approaching the transitions inherent in investing in the 9500s with trepidation.

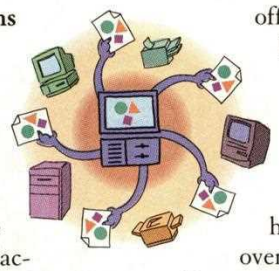
According to a report testing the Tsunami machines for publishing tasks conducted by Market Presence Inc. of Los Gatos, Calif. (see chart, Page 12), the most impressive speed increase over the Power Macintosh 8100/100 is in screen redraw. "Using the ATI [Technologies Inc.] mach64 card, 40- and 50-Mbyte [Adobe] Photoshop images scrolled in real time," said Peter Truskier, technology manager at Star Graphic Arts Inc. in Foster City, Calif., who worked on the report. "I would rather the image scroll quickly when I'm working on it than my Unsharp Mask run in 30 seconds instead of 50. That's what makes it seem like I'm working

See Focus On, Page 12

Adobe, Xinet, CoOperative offer OPI server packages

By Cate C. Corcoran

A trio of vendors have shipped new pre-press networking products that widen the range of options for publishing users who are looking for ways to streamline the production process.



▶ **Adobe Systems Inc.** this month shipped Version 2.5 of Color Central, its Open Prepress Interface (OPI) print- and image-server software. The $3,995 package for Macintosh and Windows NT servers includes improvements in font handling, AppleScript support and the user interface. Color Central 2.5 automatically reviews the font requirements of queued print files, using fonts stored on the server's hard drive for any required fonts that are not resident in the printer.

The new version promises faster printing for Adobe PageMaker 5.0 documents. Users can turn off the Include Downloadable Fonts option, and the Color Central server will hold the fonts for use by printing devices rather than having the fonts sent over the network from client to printer. Adobe said the new version improves support for AppleScript and ships with sample scripts for file management, generating low-resolution images and

See OPI, Page 12

Howtek, Mirror ship new scanners

Flatbed, drum cost under $20K

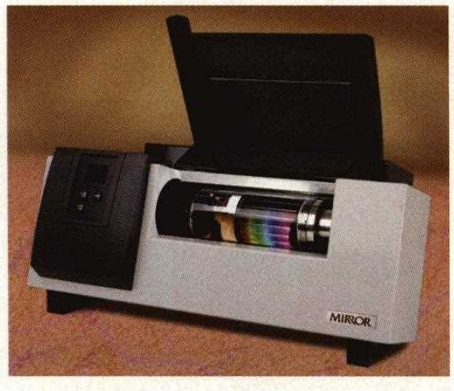
By Donna Raskin

Howtek Inc. and Mirror have each begun to ship new RGB scanners priced at less than $20,000.

Howtek's ScanMaster 2500, available now for $15,900, is a high-end flatbed addition to its ScanMaster line. Featuring a trilinear CCD (charge-coupled device) array, it can achieve 600 by 1,200 dpi in a single pass.

The device, which has a scanning area of 13 by 18 inches, captures 24- or 36-bit color, as well as gray-scale and line art. It scans reflective images or transparencies, outputting in eight- or 12-bit color.

The ScanMaster 2500 has an optical density of 3.4. Its light sources are dual fluorescent lamps. The scanner, which uses a SCSI connection, comes with an Adobe Photoshop plug-in and three holders for mounting images.



A new drum scanner, the Mirror DS4000, scans images up to 8.5 by 11.7 inches at resolutions up to 4,064 dpi.

The Mirror DS4000, a $19,900 drum scanner, captures 36-bit color data; it can collect 4,096 levels of gray and outputs 12 bits of RGB color. The device scans both reflective and transparent images up to 8.5 by 11.7 inches at resolutions up to 4,064 dpi. The DS4000 comes with one drum and a Photoshop plug-in module. A second drum costs $1,699.

The SCSI device uses photomultiplier tubes to achieve an optical density of 4.0; a halogen lamp is its light source. The drum speed is 1,200 rpm.

Howtek Inc. of Hudson, N.H., can be reached at (603) 882-5200; fax (603) 880-3842.

Mirror of Edina, Minn., can be reached at (612) 830-1549 or (800) 654-5284; fax (612) 832-5709. □

Professional Graphics

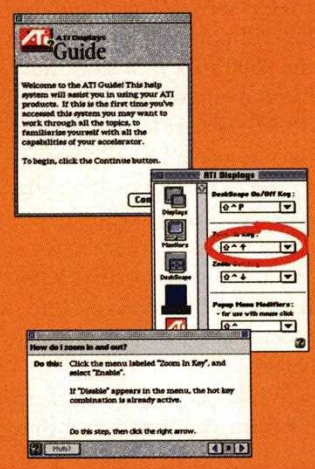
Built for the new PCI Power Macintosh computers and the powerful 9500, ATI's XCLAIM GA meets the demands of design and publishing professionals. It provides fast graphics, true color and high resolution detail and clarity, without breaking the bank.

Apple's Choice

When Apple wanted the top-of-the-line components for their state-of-the-art computer they chose ATI's graphics accelerators for some of their new PCI Power Macintosh 9500. They chose ATI for our PCI expertise and because we meet the demanding performance requirements of graphics applications.

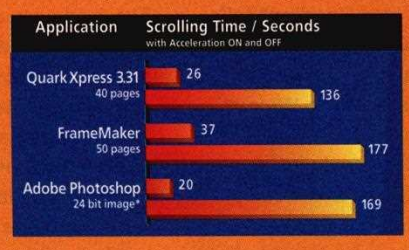
100% Macintosh

ATI's XCLAIM GA is designed exclusively for the Mac. Our powerful control panel allows you to easily access advanced features such as pan, zoom, and resolution and color switching. Walk through all these amazing features with AppleGuide. Easily connect any monitor without complicated adapter cables.


ATI Guide
Welcome to the ATI Guide! This help system will assist you in using your ATI products. If this is the first time you've accessed this system you may want to work through all the topics, to familiarize yourself with all the capabilities of your accelerator.
To begin, click the Continue button.
ATI Displays
How do I zoom in and out?
Do this: Click the menu labeled "Zoom In Key", and select "Enable".
If "Disable" appears in the menu, the hot key combination is already active.
Do this step, then click the right arrow.

Blazing Performance and Features

Be more productive in your favorite applications. XCLAIM GA performs up to eight times faster† than unaccelerated graphics. Display twice the information on-screen with 1600x1200 resolution. And you don't have to compromise speed to get photo-realistic colors.



Amazing Bottom Line

And we saved the best for last. The XCLAIM GA is affordably priced at $449* for 2MB and $649* for 4MB versions.

From $449 2MB

To find out more about this blazing and amazing product contact us at: FaxInfo Line to receive literature (905) 882-2600 Press 2 or contact ATI at GO ATITECH 76004,3656 on CompuServe or on the Internet:http://www.atitech.ca

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You want *fast* graphics.

You wish it were *inexpensive.*

You need XCLAIM™ GA.

Designed for Macintosh computers with PCI

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FOCUS ON
From Page 10

with images in real time."

Mills Davis, president of Mills•Davis, a research consultancy in Washington, D.C., said that speed will draw the high-end publishing user. "On the production side, printers and pre-press are going to absorb [the 9500s] right away for image-intensive pre-press computational work," Davis said.

"The payback on this jump in performance is very high."

Change for the bus

The switch to PCI acts as both enticement and discouragement for users looking to take advantage of performance increases while protecting existing investments. Steve Zenger, president of ImageCore Ltd., a service bureau in Buffalo, N.Y., and president of the International Digital Imaging Association, said ImageCore has been eagerly awaiting the new machines. "We want the faster, greater bandwidth of PCI, so we'll lose our investment in existing NuBus boards," he said. "You can't both move forward and stay behind at the same time."

But the bus change is daunting to others. "If we got 25 new PCI machines in here, it would present a whole host of problems we aren't willing to deal with," said Mark LaRiviere, director of promotional services at the Random House Trade Group in New York. "We will be ordering 7100s for the near future."

The PCI issue may mitigate widespread acceptance of the new Macintoshes in the publishing market. "There is such a huge investment in NuBus that the adoption will be on a slower curve," said Keith Baumann, director of digital technology at Bruce Offset, a pre-press house in Elk Grove, Ill.

Playing the slots

ImageCore's Zenger said that he will particularly welcome the 9500's six PCI slots, double the three in Power Mac 8100s. "We are looking at digital photography and we want to configure a machine that includes things like high-speed SCSI and a video board, so there's two slots. And we are looking at a GPIB [General Purpose Interface Bus] board. And we need the fourth slot for [Scitex Corp.'s] Resolute board ..."

While the feeds and speeds of the Tsunamis appeal to publishing users, some are apprehensive because of Apple's distribution track record. "We wanted the high-end 8100/100s and they weren't available anyway," said Carl Petticoffer, systems analyst for Tapsco Inc., an Akron, Pa., typesetting house. "Until I see that [the 9500s] are available, we aren't going to jump on that right away." □

Graphics apps zoom on 9500

The table shows minimum and maximum speed improvements obtained with a 9500/132 over an 8100/100. Numbers are based on the 8100/100 being 1.0; higher is better.

APPLICATION	MINIMUM SPEED INCREASE	MAXIMUM SPEED INCREASE
Adobe Photoshop	1.1	3.0
Adobe Photoshop (with FWB dual-disk array)	1.1	3.0
Adobe Illustrator	1.4	1.7
QuarkXPress	1.3	3.0
Fractal Design Painter	1.1	4.4
Macintosh Finder (file copying)	2.3	2.7
Raw disk I/O (FWB BenchTest)	1.9	4.0

Source: Market Presence Inc. For MacWEEK's benchmarks and hands-on reviews of the new machines, as well as a commentary on the 9500 in the publishing market, see Special Report, Page 28.

OPI

From Page 10

downloading PostScript files. Version 2.5's user interface lets users sort the job log by user name, job, time, page count, processing time and other characteristics.

The new version is a free upgrade from Color Central 2.2. Upgrades from Version 2.1 are $195; from previous versions, $495.

▶ **Xinet Inc.** recently shipped its contribution to the OPI server market. FullPress, for pre-press networks with a Silicon Graphics server running IRIX 5.x and Macintosh clients, comprises a file-server component for file sharing among clients, a print-server component letting users choose from networked devices and monitor print queues, and an OPI component that creates low-resolution FPO (for position only) versions of images in the publishing work flow. FullPress creates FPO files and PICT and pnot previews for TIFF and EPS files.

Pricing for FullPress starts at $7,500 for the server and six Macs. For 64 Macs and the server, the price is $18,000.

▶ **CoOperative Printing Solutions Inc.** now offers Printdesk, a Danish print spooler and OPI server line, in the United States. The Power Mac and 680x0 Mac server software lets users set up Processes, series of input streams and output devices that are accessible from the Chooser. Groups of Processes can be saved to represent the work needed on a specific day or time of day. The OPI portion of the server software supports TIFF, Desktop Color Separation and EPS files.

Printdesk Expert, which includes the print server as well as an OPI component, lists for $4,295.

Adobe Systems Inc. of Seattle can be reached at (206) 628-2749 or (800) 685-6736; fax (206) 343-4248; http://www.adobe.com.

Xinet Inc. of Berkeley, Calif., can be reached at (510) 845-0555; fax (510) 644-2680; sales@xinet.com.

CoOperative Printing Solutions Inc. of Norcross, Ga., can be reached at (404) 840-0810; fax (404) 448-7821; 70671.3371@compuserve.com. □

INTEGRATE MACINTOSHES – with – Sun/SGI/HP

K-AShare – allows Macintosh computers to use a UNIX host as an AppleShare file server.

K-FS – enables UNIX users to access AppleShare volumes on a Macintosh.

K-Spool – allows Macintosh and UNIX users to share PostScript printers anywhere on the network.

FullPress – offers integrated prepress file-sharing and print-spooling, *including OPI!*

Point and click UNIX GUI...
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Server to the Macs...

SCREEN TEST

All-digital, live-action is a first

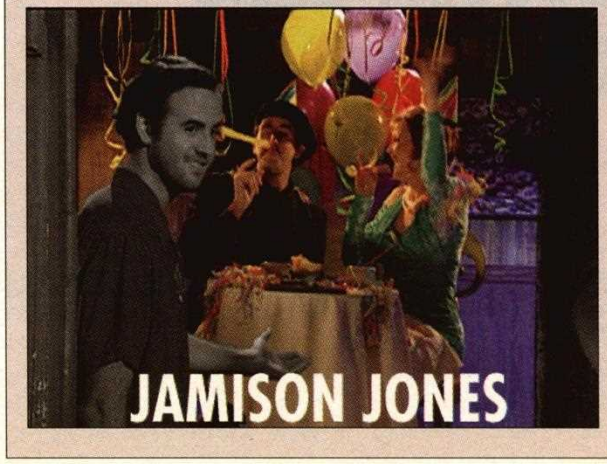
When Sony Corp. told Palo Alto, Calif.-based director/producer Robert Miller that he could borrow its Digital Betacam DVW700 camera for just four days to shoot his 12-minute movie "Mail Bonding," Miller knew that everything had to be perfect before the camera started rolling.

Shot mostly in black-and-white and without dialogue, "Mail Bonding" tells the story of a poet who falls in love with his female postal carrier.

Bob Staehle of VIZability in Walnut Creek, Calif., used a Mac and Graphisoft U.S. Inc.'s ArchiCAD to create a virtual set that Miller could explore and modify electronically, eliminating the need to change the actual set once it was built. "If we had to stop production and rebuild part of the set, I might not have finished the movie," Miller said.

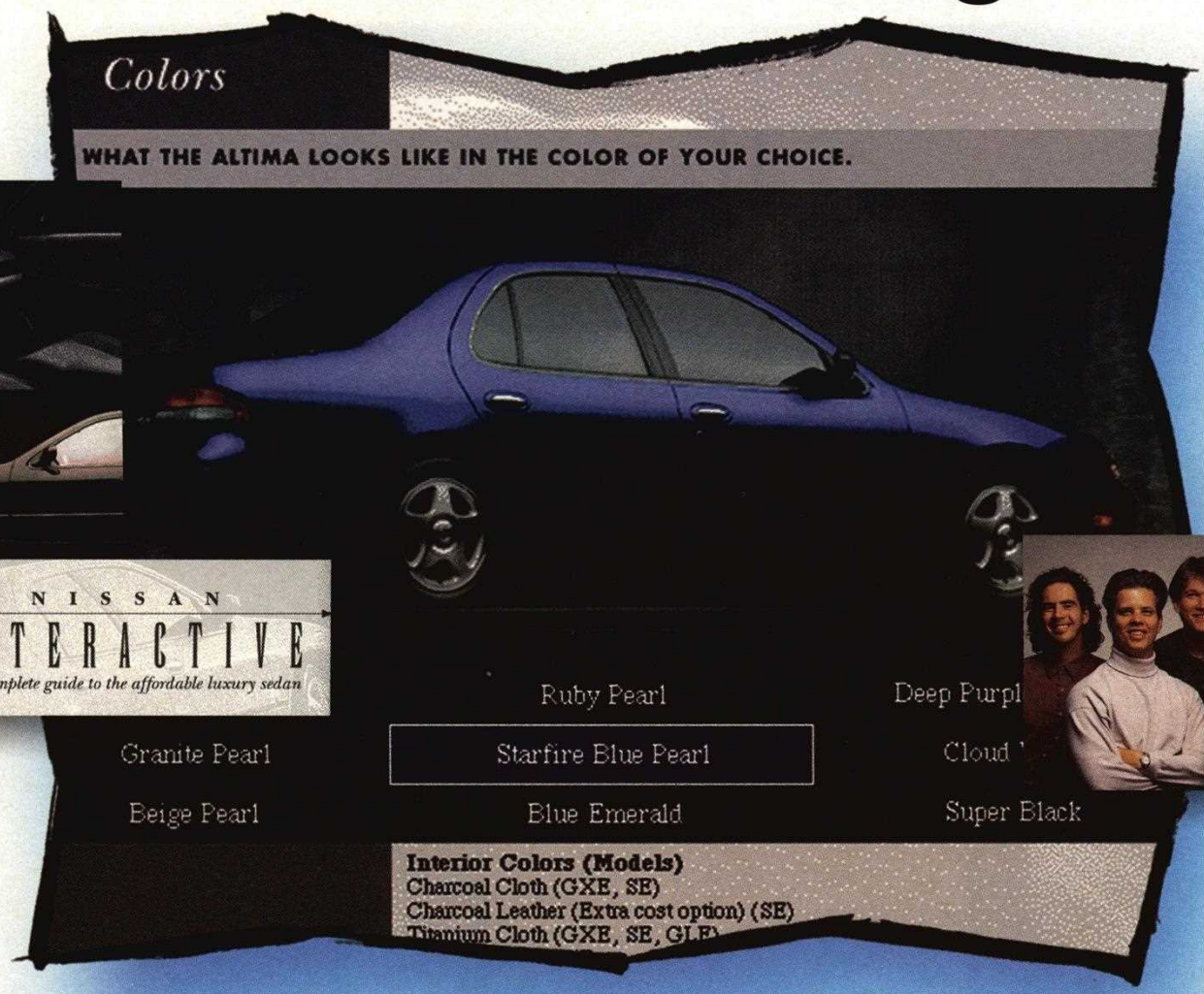
When the film went into production, the images from the camera were fed directly into the 12-Gbyte hard drive of Avid Technology Inc.'s Mac-based Media Composer 800 system, where the scenes could be placed in chronological order and instantly replayed. Miller could then see any mistakes and reshoot a scene immediately. The Avid system also allowed Miller and his editors to easily try out numerous versions of the movie and incorporate special effects before taking the film into an online editing session, which can cost as much as $300 per hour. "It saved me a lot of money and let me explore more creativity without dire consequences," Miller said.

After editing the film on the Media Composer, Miller output it to VHS tape, printed the edit-decision list, and had the final images mastered using a service provider's digital Betacam editing systems. Only then was the movie transferred to 35mm film, making it the first all-digital production of a live-action movie, Miller said.



Miller and his sponsors, Apple, Sony, Avid and Pacific Video Resources, are now planning a feature-length digital film that will go into production next year. — By Kirsten L. Parkinson

How XRONOS & Director Gave Nissan's Marketing A Boost.



"Director let us drive Nissan Interactive across platforms in world record time."

Jeff Southard, Kris Wainscott, Norbert Hendrikse, and Lee Cline of San Francisco-based XRONOS Inc., co-creators of Nissan Interactive for Nissan Motor Corporation.

To produce an interactive direct mail fulfillment kit that would give interested customers more dynamic information about the Altima, Nissan Motor Corporation turned to Chiat/Day inc. Advertising, XRONOS Inc., and Macromedia Director.

Director 4.0 gives you a powerful authoring environment to create stunning multimedia productions for entertainment, education, publishing, business, and more.

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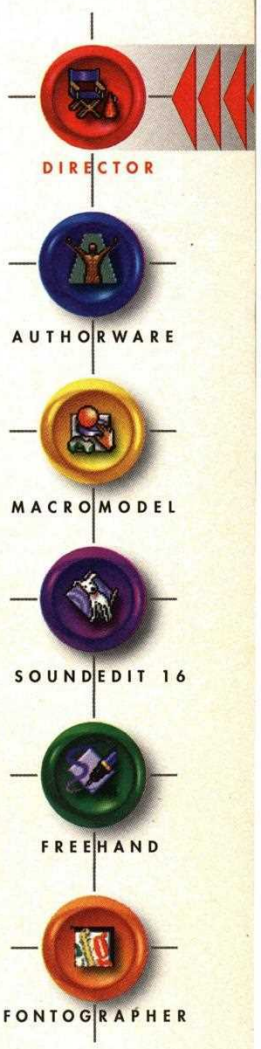

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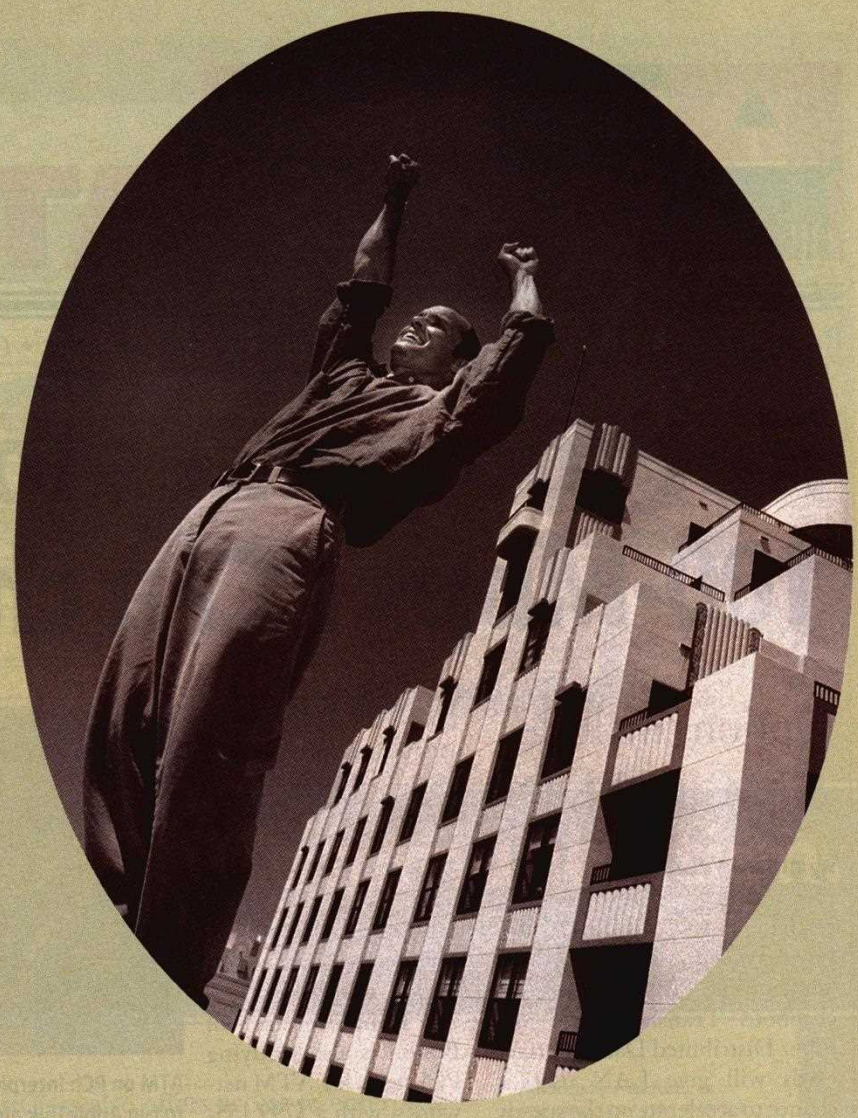

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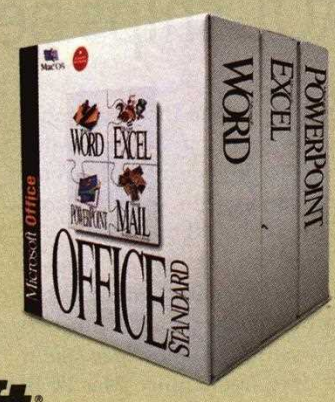

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There are only 12 or so fully world-ready Mac programs.

— John McConnell, Apple internationalization evangelist

Net companies to give 100-Mbps PCI a chance

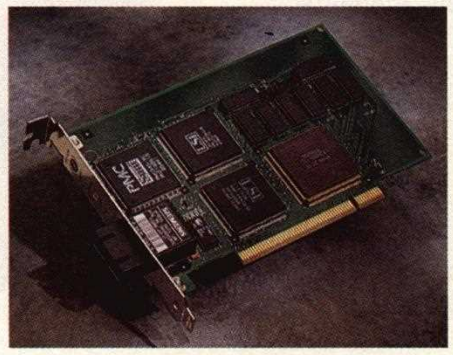
Options include ATM and FDDI

By Clifford Colby

Networking companies are readying high-speed PCI cards for this week's Power Mac 9500 launch. The fleet of fast Asynchronous Transfer Mode and Fiber Distributed Data Interface cards will give LAN users a chance to accelerate on the speedy PCI bus and take advantage of Open Transport, the native communications architecture.

▶ **Interphase Corp.** of Dallas said it plans to have Asynchronous Transfer Mode, or ATM, cards available this summer for the PCI Mac. The company in August intends to offer a $650 155-Mbps PCI card for Category 5 copper networks and an $850 155-Mbps PCI card for multimode fiber networks. Interphase will ship a $1,850 single-mode fiber card by September.

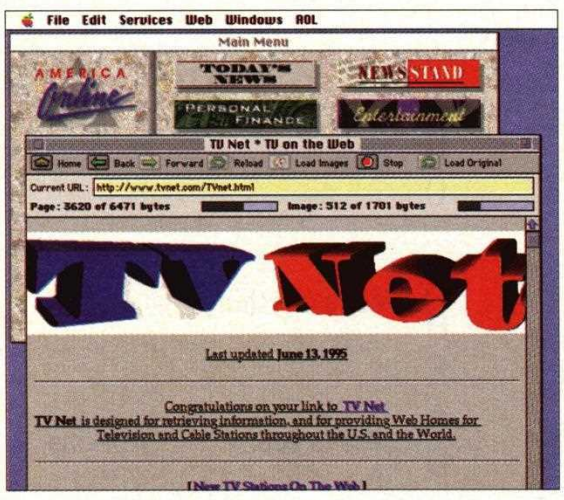
▶ **Neutral Ltd.** of Boston is also readying PCI cards for ATM networks, with a $799 155-Mbps card for copper networks and a $999 155-Mbps card for fiber. The company also said it is preparing an ATM card for Category 3 LANs, due later this year.



ATM on PCI: Interphase said users will be able to run AppleTalk and TCP/IP over ATM with its new 155-Mbps PCI cards, due in August.

▶ **Rockwell Networking Systems** of Santa Barbara, Calif., this week intends to offer Fast Ethernet and Fiber Distributed Data Interface, or FDDI, cards for the PCI Mac. The company's FDDI cards include drivers for the Mac OS, Windows and Unix and are available in a $1,295 single-at-

See PCI, Page 18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America Online expects to release the final version of its somewhat-integrated Web browser this month. The service plans to speed Web access by caching popular pages on its local servers.

AOL ships beta browser

America Online Inc. this month became the first major on-line service to provide a World-Wide Web browser to its Macintosh members.

The browser, still in beta, is InterCon Systems Corp.'s WebShark, which can be launched from within AOL's Mac client and does not require MacTCP. To increase the browser's performance over slow connections, the Vienna, Va.-based service is caching the most popular Web pages on its own servers. The browser is available at Keyword: AOL Preview, along with a beta of the America Online 2.6 client.

The new client software, due this summer, will include viewers for video and audio files and support for the Apple Speech Manager in chat areas.

eWorld, through its technology-sharing agreement with AOL, will also receive the InterCon browser. It is expected to ship for Apple's service July 17. □

Three ISDN vendors hitch rides on PCI

By Nathalie Welch

Several vendors last week announced ISDN cards for Apple's new PCI-equipped Mac.

4-Sight L.C. unveiled PCI versions of its ISDN, or Integrated Services Digital Network, cards and file transfer software. Two European vendors joined in as well: Hermstedt GmbH announced PCI versions of its Leonardo family, while SCii Telecom unveiled its Datavoice S0 PCI.

4-Sight said it will ship its $1,695 ISDN card for the PCI Mac this week. For $2,795, customers can purchase the card with 4-Sight iSDN Manager 2.0, software that performs point-to-point file transfers at rates up to 3.5 Mbytes per minute. For $3,995, the card will come with 4-Sight iSDN Broadcast, which sends files to multiple destinations simultaneously. Prices for the PCI cards are the same as the company's earlier NuBus models.

According to 4-Sight, the PCI cards will exchange files with NuBus ones if both ends have iSDN Manager installed.

Hermstedt's Leonardo XL, a four-channel ISDN board, will also be available this week. The two-channel Leonardo SP will follow later. Prices and U.S. distribution plans were not available.

SCii Telecom said its Datavoice S0 PCI card will offer the standard two 64-Kbps channels of a Basic Rate Interface line. The company said the 16-Kbps "D" channel can access X.25 services at 9,600 bps. Prices were not available.

4-Sight L.C. of West Des Moines, Iowa, can be reached at (515) 221-3000; fax (515) 224-0802 or (800) 448-3299; foursight.lc@applelink.apple.com.

Hermstedt GmbH of Mannheim, Germany, is at 49-621-7650-0; fax 49-621-76 50-100.

SCii Telecom of Paris is at 33-1-4417-4418; fax 33-1-4417-4419. □

FOCUS ON

OPERATING SYSTEMS

Copland to play the polyglot

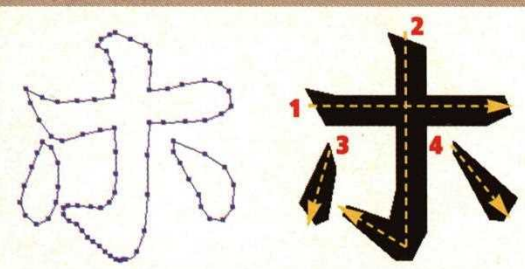
By David Morgenstern

Although WorldScript and QuickDraw GX give today's foreign-language systems a wide range of localized typographical features, users can look forward to expanded capabilities in the Copland operating system. The major Mac OS revision, officially slated for mid-1996, will increase use of QuickDraw GX, enhance font display and storage efficiency, improve text handling, and introduce a powerful Unicode-based translation engine.

"GX and WorldScript are slipped on top of a 10-year-old OS," said Product Manager Ryland Madison with Nisus Software Inc. of Solana Beach, Calif. "It's really starting to show its age."

The most significant WorldScript addition in Copland will be an intelligent text handler called Text Objects. The technology will let developers add hidden tags to words, a boon to international software of all stripes.

New OS to brush up fonts

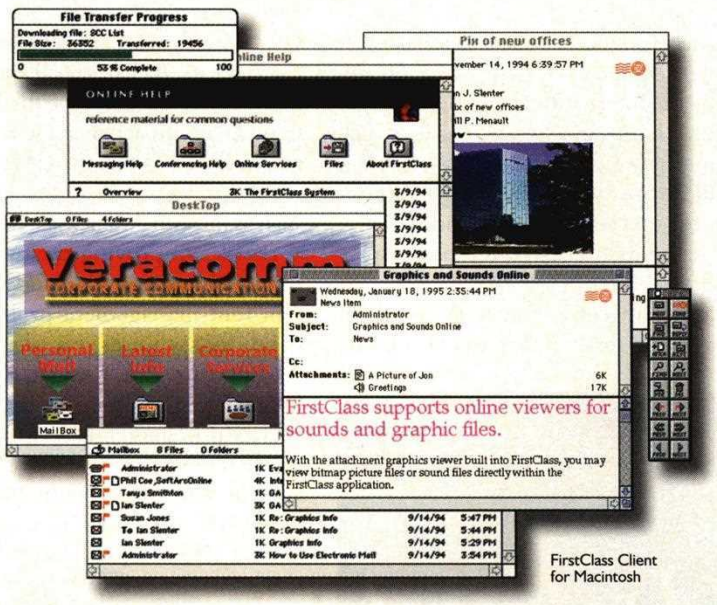


Outline font
- 6 Mbytes to 8 Mbytes
- Requires hinting

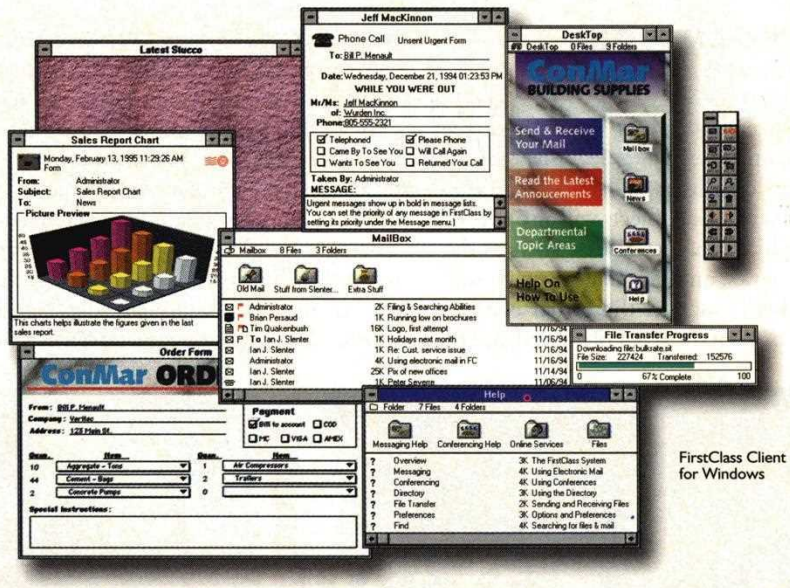
Stroke-based font
- 1 Mbyte to 2 Mbytes
- Built from parts

Apple said the tags are critical to improving basic Japanese language input by linking ambiguous kanji ideograms with kana characters and pronunciations. The annotations could also include grammatical data, alternate spellings and

See Focus On, Page 18



FirstClass Client for Macintosh



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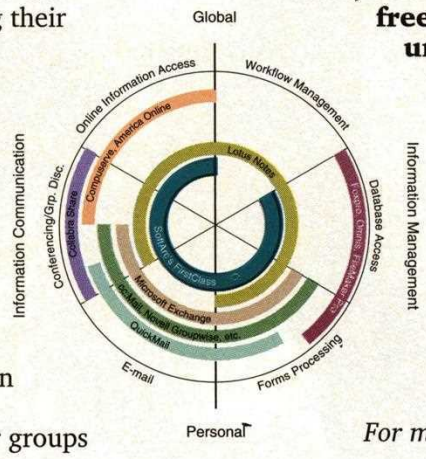

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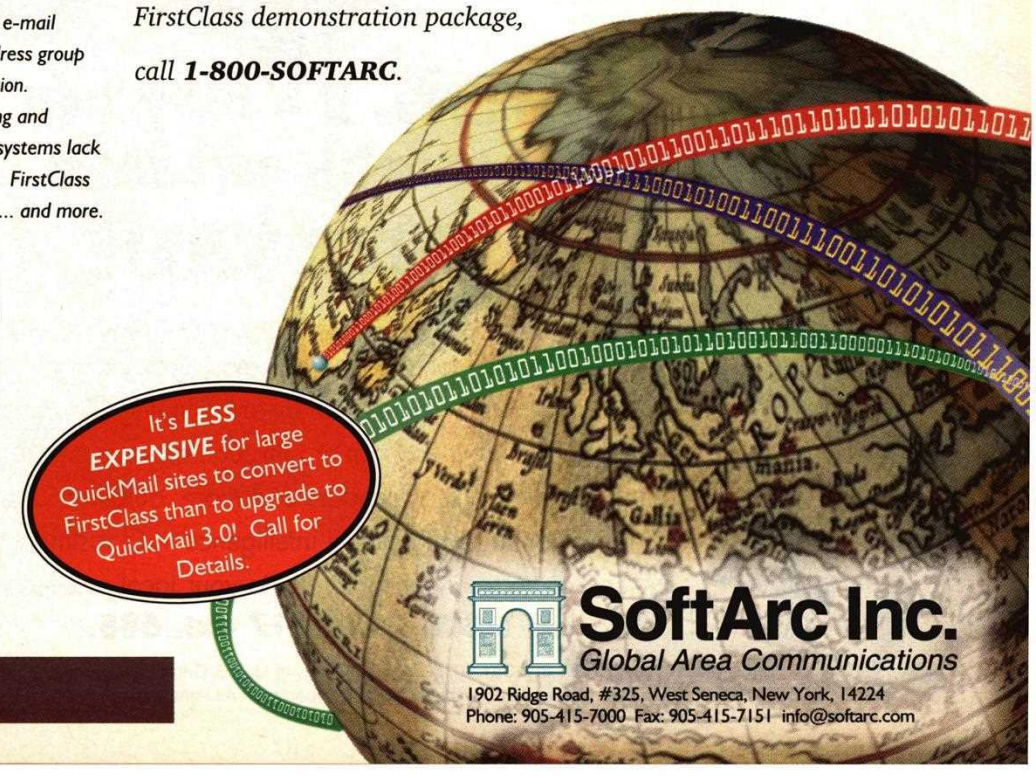

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FOCUS ON

From Page 16

text-to-speech cues that load the correct speech synthesizer when reading a mixed-language document.

Apple said Text Objects will also support typographical characteristics, such as diacritical marks, and language-specific sorting methods, such as those that consider characters from the front of a word and the back. The Text Objects API, therefore, will solve problems for database and utility software vendors implementing WorldScript.

In addition, Copland will greatly expand Apple's support for Unicode, the international standard for two-byte characters.

Besides improved handling of embedded spacing and right-left control characters, the new OS will feature a Unicode conversion engine that will automatically translate among different language tables. Applications, such as Internet browsers, will be able to use the engine to display characters defined by the International Standards Organization's Latin and two-byte sets, which are commonly used in Internet newsgroups.

While upgrading WorldScript's foundation for text services, Copland will also advance the Mac's base-level font-display capabilities.

Clearing up current uncertainty about whether users have installed QuickDraw GX, Copland will apply GX's text-services manager to all character display and printing. This should improve the appearance of familiar multipart characters, such as ligatures, as well as foreign-language elements with vertical text and contextual letter forms, such as those in Arabic.

Besides improving the display of non-roman characters, Copland will ease current font-management problems and expand font choices via the Open Font Architecture. According to Apple, the new font scheme will permit the use of compact, stroke-based fonts that will build characters on the fly. This will mitigate current storage problems for bulky two-byte TrueType and PostScript fonts.

Font size is a problem in international markets. Current two-byte formats run from 6 to 8 Mbytes per font, while stroke-based fonts will require less than 2 Mbytes, Apple said. The new technology will benefit capacity-conscious users, especially mobile ones, and will reduce the size of portable digital documents containing two-byte text. Outline fonts will still be used for publishing applications, Apple said.

According to developers, other day-to-day benefits for Copland's foreign-language users will be the elimination of workarounds when shifting among related language systems, such as Arabic and Farsi.

"Copland will be real smooth," said Nisus' Madison. "I can't wait." □

PCI

From Page 16

tached fiber version, a $1,795 dual-attached model for fiber and a $795 single-attached board for Category 5 copper.

- **Digital Equipment Corp.** of Maynard, Mass., is also jumping on the PCI bandwagon. Digital said it plans this summer to have a card for Fast Ethernet and three versions for FDDI: a $695 single-attached card for copper networks, a $1,195 single-attached card for fiber and a $1,695 dual-attached fiber version.
- **Spectra Systems Corp.** of Alpharetta, Ga., will ship FDDI PCI cards this week. The company will offer a $695 single-attached card for copper LANs and a $795 one for fiber, and it expects to have dual-attached cards ready by early September.
- **Team Advanced Systems Associates** of San Diego plans to release later this summer a $1,795 single-attached FDDI card. The company expects to offer a dual-attached card by the end of the year. The board will come with Team ASA's FiberTalk Pro software, which includes AppleTalk, TCP/IP and FiberTalk drivers for FDDI.
- **Apple,** too, is working on PCI cards. Bill Brown, connectivity products group manager, said the company is working on a Fast Ethernet board and others for winter. "You can expect to see something from us in the 100VG-AnyLAN space," he said.

The company also intends to ship a 4-Mbps and 16-Mbps token-ring card. It is working on cards for 10-Mbps Ethernet and FDDI plus a multiport serial card to accompany future servers, Brown said. Apple is also working on 25-Mbps and 155-Mbps ATM cards for 1996 releases. □

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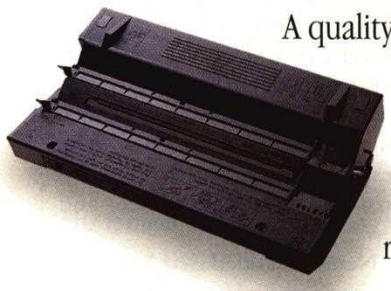

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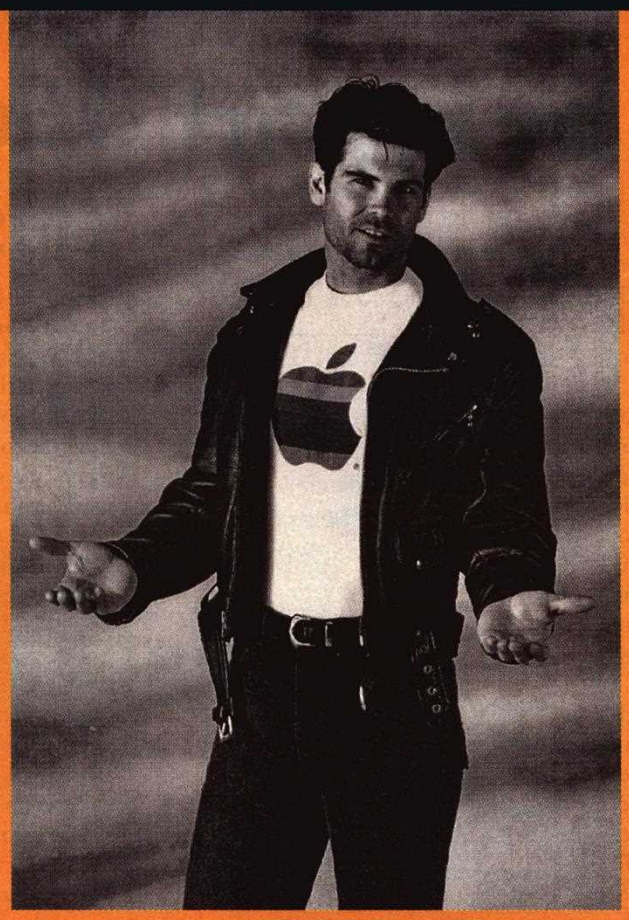

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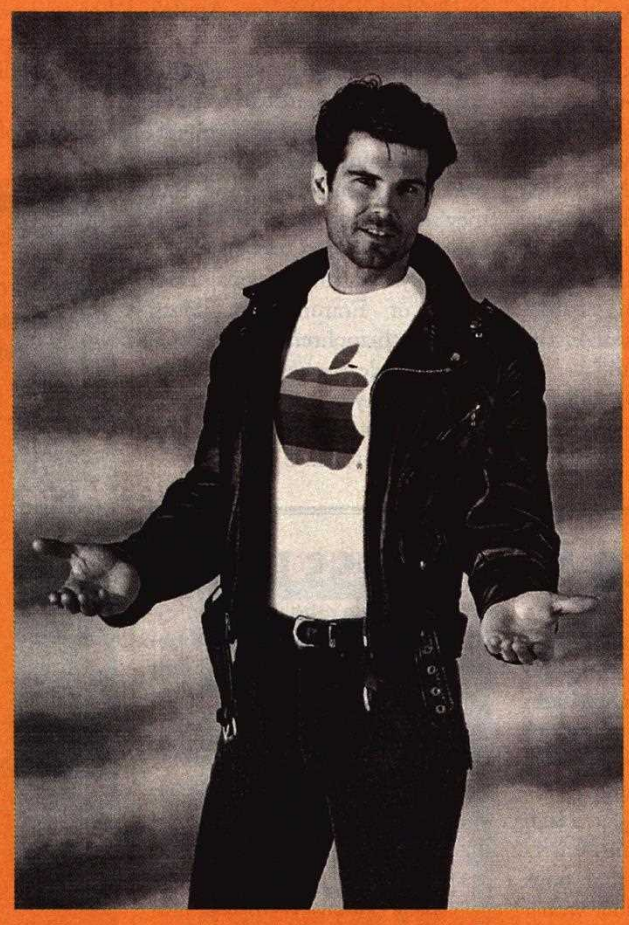

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BUSINESS

THE MUSIC MEN

Nearly all music software users in the United States, 93.5 percent, are male.

— Lou Harris poll

Apple bitten by report

Analysis chides 'split personality'

By Don Monkerud and Jon Swartz

Just as Apple begins to win accolades for its cloning strategy, a controversial report by a New York-based investment firm assails the company for fumbling its competitive advantage.

The 41-page report, titled "The Two Faces of Apple: Incumbent or Challenger?" focuses on what CS First Boston Corp. analyst William Gurley calls Apple's corporate Achilles' heel: schizophrenia. "Apple is attempting to be too many things to too many people," he wrote in the report.

Evidently, the scathing analysis has had an effect. Sources said Apple CEO Michael Spindler in recent weeks has been seen waving a copy of the report and reciting passages.

In the report, Gurley contends Apple doesn't know whether it wants to be an incumbent — maximizing its considerable brand-name recognition in traditional market strongholds such as desktop publishing, home and K-12 — or a challenger — taking on Microsoft Corp. and Intel Corp. in a "high-risk strategy" to recapture market share.

Gurley clearly supports the former tactic and considers PowerPC, Pippin, QuickTime, eWorld and Newton as positive steps in that direction. Those products, he argues, will enable Apple to exploit the architecture of the Mac OS.

But grander plans by Apple to enlarge its share of the global personal computer market could leave it susceptible. Projects aimed at improving the company's lot in cross-platform environments — Houdini, Insignia Solutions Inc.'s SoftPC, Common Hardware Reference Platform and OpenDoc — received low grades because Gurley feared they would lead to "commoditization" of the Mac OS.

Apple's corporate review

THUMBS UP

- PowerPC
- Strongest brand name in PC industry
- Dominates DTP, K-12 markets
- Pippin/QuickTime
- eWorld
- Newton

THUMBS DOWN

- Corporate schizophrenia
- Attempting to take on Microsoft
- Belated OS licensing
- Houdini/SoftPC
- CHRP
- OpenDoc

Source: CS First Boston Corp.

Even more troublesome, Gurley wrote, is Apple's belated decision to license the Mac OS, a move he contends should have been made in 1984. Even in Japan, where Apple expects success, it is "unlikely it could match the availability of Intel-based hardware and software," he wrote. "Confronting [Microsoft] head-on seems more an endeavor of heroism than an effort to maximize shareholder value. Rather than fighting a losing battle, Apple needs to optimize the value of the Apple brand."

Licensing the Mac OS will also lead to cannibalization by both Radius Inc., which will siphon market share from Apple's high-margin products, and Power Computing Corp., which will steal sales directly from Apple's installed base, he wrote.

Industry sources, meanwhile, are giving the report bad reviews. "Apple got beat up by the investment community for having a proprietary system, and now that they're opening it, they're being blasted," said Joan Carol-Brigham, an analyst at International Data Corp. of Framingham, Mass. "Who's schizophrenic here?"

An Apple spokeswoman said the company is committed to its licensing plans and to expanding the Mac platform. □

Cisco Systems splits into 5 business units

By Jon Swartz

Cisco Systems Inc. of San Jose, Calif., this month splintered into five business units to accelerate development of its major networking products.

Each of the units — Workgroup, ATM High End, Access, Core and IBM Internetworking — will have its own engineering and marketing operation and will be led by a vice president/general manager.

A quick look at the organizational reshuffling:

- **Workgroup.** Includes LAN switching, ATM workgroup and adapter products from acquisitions of Crescendo Communications and Kalpana Inc. Mario Mazzola heads the unit.
- **ATM High End.** Entails enterprise Asynchronous Transfer Mode switch products from LightStream Corp., which Cisco bought this year. Paul Lazay heads the group.
- **Access.** Responsible for stand-alone routers, dial-up access servers and software routers inherited in the buyout of Newport Systems Solutions. The unit is led by Don Listwin.
- **Core.** Frank Marshall heads this group in charge of backbone routers and strategic alliances involving backbone routing, switching technologies and telecommunications services.
- **IBM Internetworking.** Includes routers and software designed to integrate IBM-based networks with LANs and WANs. The group, based in Research Triangle, N.C., is led by Selby Wellman. □

Microsoft, Justice clash over bundle

By Jon Swartz

The U.S. Justice Department is taking its third investigative crack at Microsoft Corp. At issue this time: the company's plan to bundle its on-line service, Microsoft Network, with Windows 95.

Federal authorities have issued Microsoft a subpoena asking for information about its distribution plans for Microsoft Network. The government has also requested documentation from America Online Inc. of Vienna, Va.; Prodigy Services Co. of White Plains, N.Y.; Apple's eWorld; and others.

Competitors fear that including Microsoft Network might give Microsoft an unfair market advantage when Windows 95 debuts Aug. 24. Redmond, Wash.-based Microsoft is expected to sell 30 million copies of the OS in its first year; the other commercial on-line services combined have about 7 million users.

Microsoft executives said the bundling plan is legal and will help users. "The on-line services business is an emerging, growing field," said William Neukom, Microsoft general counsel. "The result of our entry will be increased consumer choice and lower prices."

Neukom added that bundling on-line access software with personal computers is nothing new. For example, eWorld comes installed on all Macs.

George Cumming, an antitrust lawyer at Brobeck, Phleger & Harrison in San Francisco, said the basis of the federal probe grows out of the implications of tying the sale of one product to another.

Microsoft has faced five years of antitrust scrutiny. Prior to a government lawsuit that forced Microsoft to scotch its proposed buyout of Menlo Park, Calif.-based Intuit Inc., the Justice Department and Microsoft clashed over a controversial OS licensing practice. □

MacWEEK index

MAC UTILITY SOFTWARE SALES

Symantec Corp. and Berkeley Systems Inc. dominated the top 15 spots in sales for Mac utility software. Rankings were based on sales from thousands of U.S. dealers.

RANK	TREND	PRODUCT
1	▼	Connectix RAM Doubler 1.5
2	▲	Apple System 7.5
3	▼	Symantec AntiVirus for Mac 4.0
4	▼	Berkeley Systems After Dark 3.0
5	▲	Viacom Internet starter kit
6	▲	Casady & Greene Conflict Catcher 3.0
7	▲	Symantec Norton Utilities for Mac 3.1
8	▲	Symantec Think C 6.0
9	▲	Berkeley Systems Looney Tunes screen saver
10	▼	CE Software QuicKeys 3.0
11	▲	Stac Stacker 4.0
12	▲	Dantz Retrospect
13	Unchanged	Symantec Suitcase II
14	▲	Datawatch Virex Mac 5.5
15	▲	Berkeley Systems Disney screen saver

Source: G. Meier Inc.

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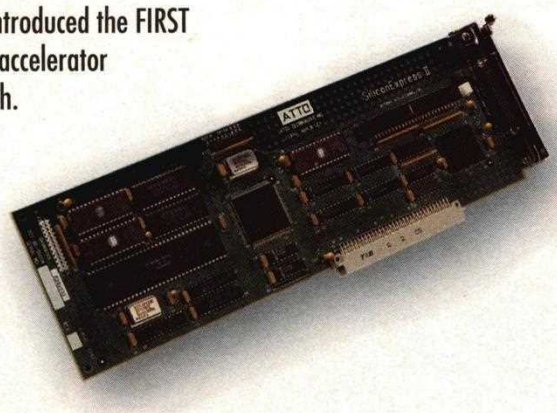
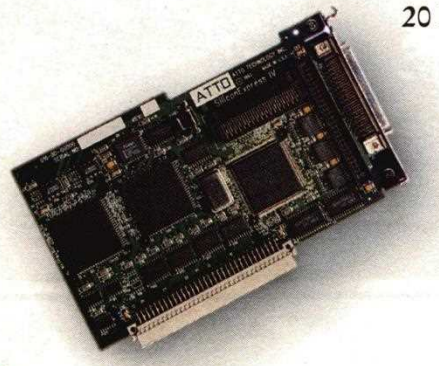
1989

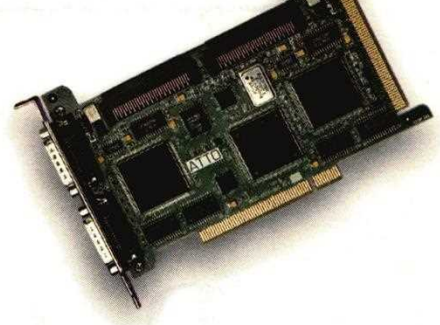
ATTO Technology introduced the FIRST SCSI-2 Bus Master accelerator board for Macintosh.



SiliconExpress II
10 MBytes/sec.



SiliconExpress IV
20 MBytes/sec.



ExpressPCI
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ATTO launched the FASTEST, BEST SELLING, SCSI-2 FAST/WIDE NuBus accelerator for Macintosh.

1995

ATTO now presents the FASTEST SCSI-3 solution for your PCI based Power Macintosh.

WHO'S THE FASTEST?

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"For Any Drive, ATTO's SCSI-2 Card Is The Fastest."

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Editors' Choice Award
Best SCSI Accelerator Card
July 1995

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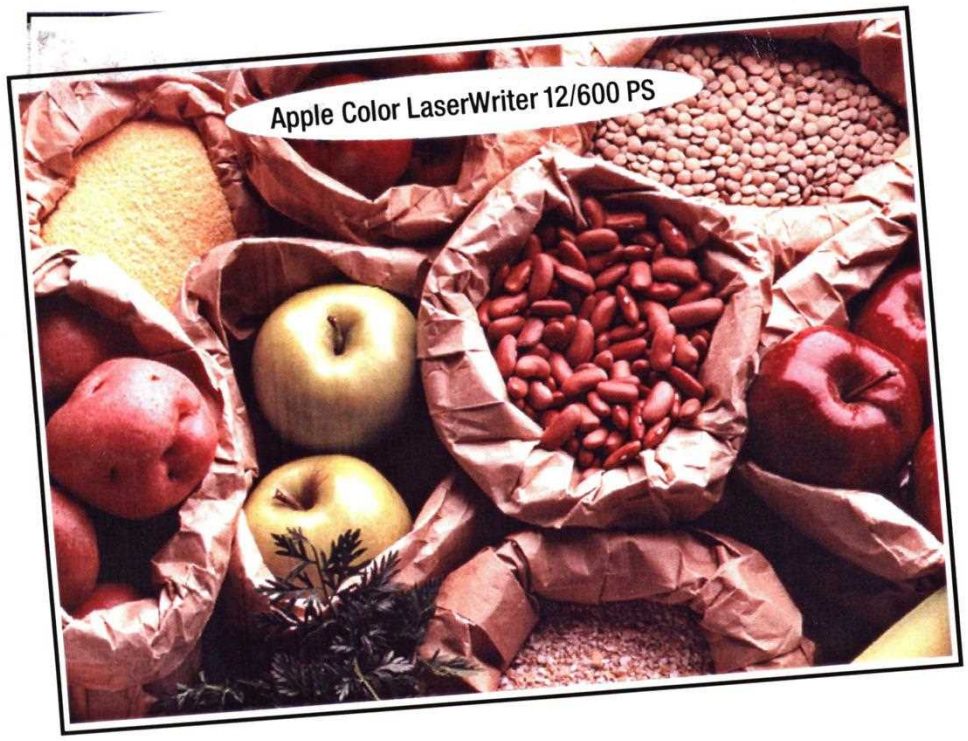
A picture is worth
But for some reason, Hew

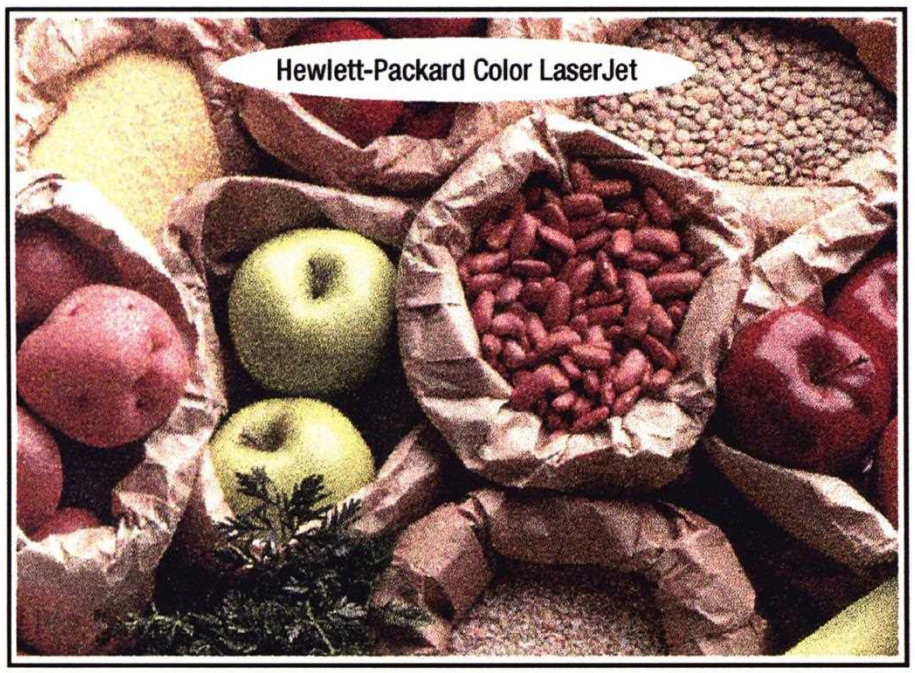
In this case, a picture seems to be worth slightly more than a thousand words. Because after seeing the difference between printers, we just couldn't keep quiet. As you can see above, the Apple® Color LaserWriter®12/600 PS with Color PhotoGrade delivers near-photographic quality that can make virtually everything you print more expressive. True 600 dpi resolution means that sharp, black text always comes out as sharp, black text. Your PostScript™ and TrueType® fonts, as well as your

Introducing the Apple Color LaserWriter 12/600 PS

The Apple output shown was printed on the Color LaserWriter 12/600 PS with all printer settings set to default. The Hewlett-Packard output shown was printed on the HP Color LaserJet with the PostScript upgrade and with all printer settings set to default except the halftone setting set to scatter dither (enhanced) mode. *© 1995 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, ColorSync,*



Peel off



A picture is worth a thousand words. But for some reason, Hewlett-Packard is speechless.

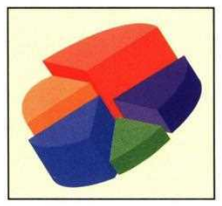
In this case, a picture seems to be worth slightly more than a thousand words. Because after seeing the difference between our color laser printer and Hewlett-Packard's, we just couldn't keep quiet.

Introducing the Apple Color LaserWriter 12/600 PS

Apple

The Apple Color LaserWriter 12/600 PS

Even though our demonstration speaks volumes, we thought you might like to hear a few more words about the first Apple® Color LaserWriter®—the Color LaserWriter 12/600 PS.



As you can see from the comparison, it gives you nothing less than the highest color print quality possible. Incorporating an Apple breakthrough called Color PhotoGrade, the Color LaserWriter 12/600 PS delivers near-photographic quality that can make virtually everything you print more expressive.

COLOR WITHOUT COMPROMISE.
COLOR WITHOUT COMPROMISE.
COLOR WITHOUT COMPROMISE.
COLOR WITHOUT COMPROMISE.
COLOR WITHOUT COMPROMISE.

You'll find this even extends to black printing. True 600 dpi resolution means that sharp, black text always comes out as sharp, black text. So your PostScript™ and TrueType® fonts, as well as your line art, have never had more impact.

It also provides you with something no other printer in the world can: the renowned plug-and-play simplicity that can only come from Apple. Just hit Print. With ColorSync® 2.0, our seamless color-matching technology, the color you see on your monitor is the color you see on your paper. Changing the toner cartridges is almost as simple. Which means you can actually do it yourself without having to call tech support. And with PostScript and built-in Ethernet, you can easily print work over any Novell, AppleTalk® or TCP/IP network—whether you use UNIX,® a PC running Windows or a Macintosh® personal computer.

ColorSync® 2.0

Think of it as color without compromise. That's how we like to refer to it.

If you'd like to hear even more words about the new Apple Color LaserWriter 12/600 PS (words like "surprisingly affordable," just to name a few), call 1-800-538-9696, ext. 525, for the authorized Apple reseller near you. Or, if it's more convenient, look for us on the Internet at http://www.apple.com.

Then again, maybe we don't need to say anything else about it. One print could actually tell you everything you want to know.

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The Apple output shown was printed on the Color LaserWriter 12/600 PS with all printer settings set to default. The Hewlett-Packard output shown was printed on the HP Color LaserJet with the PostScript upgrade and with all printer settings set to default except the halftone setting set to scatter dither (enhanced) mode. *©1995 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleTalk, ColorSync, LaserWriter, Macintosh and TrueType are registered trademarks of Apple Computer, Inc. Mac and the Mac OS logo are trademarks of Apple Computer, Inc. PostScript is a trademark of Adobe Systems Incorporated or its subsidiaries and may be registered in certain jurisdictions. UNIX is a registered trademark of Novell, Incorporated, in the United States and other countries, licensed exclusively through X/Open Company, Ltd. All Apple products are designed to be accessible to individuals with disability. To learn more (U.S. only), call 800-776-2333 or TDD 800-833-6223.*

a thousand words. lett-Packard is speechless.

line art, have never had more impact. And it's incredibly easy to use. Just hit Print. With ColorSync® 2.0, our seamless color-matching technology, the color you see on your monitor is the color you see on your paper. To hear even more words about the Apple Color LaserWriter 12/600 PS (words like "surprisingly affordable" and "cross-platform compatibility," to name just a few), call 800-538-9696, extension 525, for the authorized Apple reseller near you. Or, if it's more convenient, visit us on the Internet at http://www.apple.com. Enough said.

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BPA INTERNATIONAL

Adobe rules

The dominance of Microsoft Corp. is sometimes overblown. That's particularly true in the Macintosh market. Although an influential company, Microsoft is not the most powerful and certainly not the most important third-party developer for Apple and Mac users. That position belongs to Adobe Systems Inc.

Like Microsoft, Adobe has established critical software platforms. It owns the standard for page description languages with PostScript, providing the company with an annuity akin to a popular OS. It is attempting to create another industry-standard architecture with Acrobat's Portable Document Format for electronic files. Odds are it will succeed. The company's flagship application, Photoshop, has fostered its own little industry of plug-ins and accelerator cards. And Illustrator has a large and loyal following.

Adobe's acquisition of Aldus Corp. increased its stable of leading graphics applications. PageMaker 6.0, now on the horizon, does not appear ready to wrest back market territory from QuarkXPress but should continue to contribute a respectable number of sales to the bottom line. PageMaker 7.0 will reportedly have bold improvements.

These products all make Adobe financially healthy. Its revenues and profits continue to grow. It is in the top tier of all software companies in the computer industry. It is on top in the Mac market.

Adobe's dominance can also be measured in what it accepts and what it rejects from Apple. The company has given a thumbs up to multiprocessing and is contemplating QuickDraw 3D but has ignored QuickDraw GX. Without an endorsement from the premiere graphics-application developer, GX is destined to languish.

Now we see Adobe expanding its role in the digital video market. Its Premiere video-editing program looks as if it will be strengthened with the reported purchase of Radius Inc.'s Cinepak compression software. And it appears as if Radius will get an Adobe executive on its board of directors. All this adds to and underscores Adobe's well-earned and lofty position in the Mac market. □

THE SECOND DECADE HENRY NORR

If control is what you need, Win 95 leaves Mac behind

Just hours after I finished last week's column — about the absence of built-in tools for central management of user desktops from current and, apparently, future versions of the Mac OS — I sat down to a presentation from Microsoft Corp. on Windows 95 as an IS manager would see it.

To be perfectly honest, I was astounded. In many respects Windows 95 merely approximates what the Mac has delivered for a decade, but in the area of IS management it takes a long leap ahead. While Apple's only answer to corporate administrators concerned about configuration management and security is to suggest add-on products — third-party offerings or its own At Ease for Workgroups — Microsoft's new OS is designed from the ground up to support centralized management.

In this arena, I'm afraid, it's now Apple's turn to play catch-up.

Field day for managers

Start with setup. While Apple supports system-software installation over the network, users have to initiate the process, and managers can't control their choices. Windows 95 allows "push" as well as "pull" installations, and a graphical editor helps administrators generate setup scripts that automate the entire process, even writing approved settings into each computer's Registry (Windows 95's convenient local database for configuration information).

Like Copland, Windows 95 can automatically reconfigure the local environment to match the preferences and privileges of the user logging in. But Windows 95's "profiles" and "policies" mechanisms let administrators impose as much control, on an individual or group basis, as particular situations or company policies require. Managers can block access to Registry-editing tools or to DOS; restrict which applications can be launched; remove the Find, Run and Shutdown commands; and even specify the desktop décor.

Plugging the gaps

In the area of security Windows 95 doesn't hold a candle to big brother NT, but it puts the Mac OS to shame. Rather than building a whole new security architecture, Microsoft relies on mechanisms already available: Even local log-ins are authenticated through the server's security system. Windows 95 supports Mac-style file sharing, including a password scheme that's as rudimentary as the Mac's, but administrators can require use of more stringent server-based security or simply disable sharing altogether — exactly the kind of options many Mac administrators have demanded for years to no avail.

My point here is not that Windows 95 is without flaws; as the press has shown, it has plenty of them, and skepticism seems to be mounting at many corporate sites. But if Apple has any prayer of capitalizing on Microsoft's weaknesses, it must start learning from its rival's strengths — first and foremost, at least when it comes to the corporate market, is Windows 95's attention to the needs of IS managers. □

Henry Norr, editor emeritus of MacWEEK, welcomes feedback in the MacWEEK forums on CompuServe or eWorld or at hnorr@ftp.macweek.ziff.com.

LETTERS

Integrity too much to ask?

Hey, is a little journalistic integrity too much to ask from a computer magazine? I refer to Don Crabb's column (MacWEEK, June 5, Page 29) complaining about the "virus," which I consider nonexistent, in Windows 95.

Sure it's fun to bash Microsoft, but can't we do it by telling the truth instead of printing information known to be false? It would be one thing if the news had broken just before you went to press, but the story had been thoroughly debunked in the Usenet comp.risks newsgroup and elsewhere by May 18.

Instead of informing the public, you are being misleading, not to mention adding to the confusion and paranoia that already exists in reference to viruses.

If we want trash journalism, we can find it at the grocery checkout counter.

Ross Nelson
Sunnyvale, Calif.

Nail Microsoft — right on!

You are right on the mark and I support your enthusiasm in desiring to smash the Mafia approach Microsoft has taken with its Registration wizard. I, for one, have rejected using any Microsoft products whatsoever because of its poor quality control and cryptic software designs. Keep up the good article writing.

Gregor Saveskie
Adobe Systems Inc.
Mountain View, Calif.

Don, give Dan a break

After reading Don Crabb's "Apple makes the grade at developers conference" (MacWEEK, May 22, Page 29) I wondered if he and I were even at the same event.

I thought Dan Eilers' keynote was at least one of the most entertaining. And after four days where the quality of presentations was starting to bore me to tears, I was glad to have someone giving me information that was interesting, relevant and easy to extract.

I never saw an instance where Apple attempted to keep information from developers. They answered every question asked, even if it was with "We hadn't thought of that" or "That hasn't been worked out yet." The only thing they did too much of was repeating the Copland architecture overview.

After the Apple Worldwide Developers Conference I see no reason why anyone would buy any other platform. Windoze 95 is just playing catch-up with the current OS.

One thing I really didn't like about WWDC was the amount of whining to be heard from developers. I wanted to kick some of my comrades for their childish desire to have Apple solve all their problems, pay for their development and marketing, and change their diapers.

Rant mode off.

Ron Davis
Software engineer
Datawatch Corp.
Raleigh, N.C.

Real skinny on monitors

Both Scott Harris' column (MacWEEK, April 10, Page 21) and the letter from Stephen Masiclat (MacWEEK, May 15, Page 27) call for an opposing response.

The Apple Color Plus Display is an inexpensive, disposable color monitor. If a disposable product is an issue for people like Masiclat, one option is to buy another display that may cost more but has more features. Switching to another vendor because of the service policy for a single product may be a disservice — you automatically write off Apple's other high-quality displays.

While the whole-unit replacement strategy may seem extreme for electronic equipment, it is used by many manufacturers. Harris and Masiclat should take note that the Apple Color Plus Display is only one of a handful of Apple products "repaired" in this manner. Sadly, the next step up, the Apple Multiple Scan 15 Display, is also handled like the Apple Color Plus Display, while the recently discontinued Apple Color Display was not.

Regardless of how an item is repaired, one would hope that a product would be as reliable as its siblings.

This is the case for most, but not all, of the Apple Color Plus Displays. I have replaced more than three dozen of these displays, all of which had lost power. The few that happened to be out of warranty were replaced at no charge by Apple.

Apple has just announced an official repair extension program for Apple Color Plus Displays shipped before December 1994 that covers the replacement of displays that either have no power or have a jammed power switch.

Chip Moody
Piscataway, N.J.

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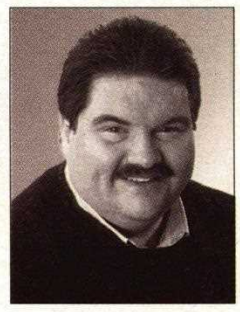
THE MAC MANAGER DON CRABB

Lockheed asks whether Macs are really necessary

A few weeks ago I urged Lockheed Missiles & Space Co. Inc. of Sunnyvale, Calif., to carefully consider the consequences of dumping its corporate Macs in favor of Intel-standard PCs.

Since then, I have been corresponding with a senior manager at Lockheed on the committee "planning [its] future workplace computing environment." The committee is trying to cut per-person computing costs while enhancing productivity. They're considering doing this by moving to a single platform.



Asked and answered

Lockheed: *Why should we maintain two different office systems, Mac and PC?*

Crabb: Users respond differently to OSes and graphical user interfaces. Computer empowerment requires noting this and providing the environment that works best for each person. Supporting two standards is not unreasonable, especially since Macs and PCs can be made to behave together.

How do we solve our inability to read files prepared with later versions of PC software that are not available on the Mac until months later?

You're getting some bad file-format advice. First of all, file formats don't change every time software gets revised. When changes do occur, you'll often find you can read the files with the older software just by dropping in a translator/extension from the vendor.

Or you can use an add-on file translator such as DataViz Inc.'s MacLinkPlus or Systems Compatibility Corp.'s Outside In.

The future

Why should we make a major investment in maintaining a Mac environment when the Mac's office market share is less than 10 percent and projected to decline?

Who cares what the Mac's market share really is? Apple cares, because that's its livelihood. And who says it's declining? Apple sold more Power Macs in the past year than the wildest projections had forecast.

Do you really believe that Apple, a $10-billion-a-year company, is going out of business soon? A few years ago, Lockheed seemed headed for the big hangar in the sky. Yet now it's doing well.

Your only business question is this: Do Macs do the job you need at a competitive price? Do they offer advantages over PCs at the same price? I think you will find the honest answer to both questions is yes. If not, buy PCs.

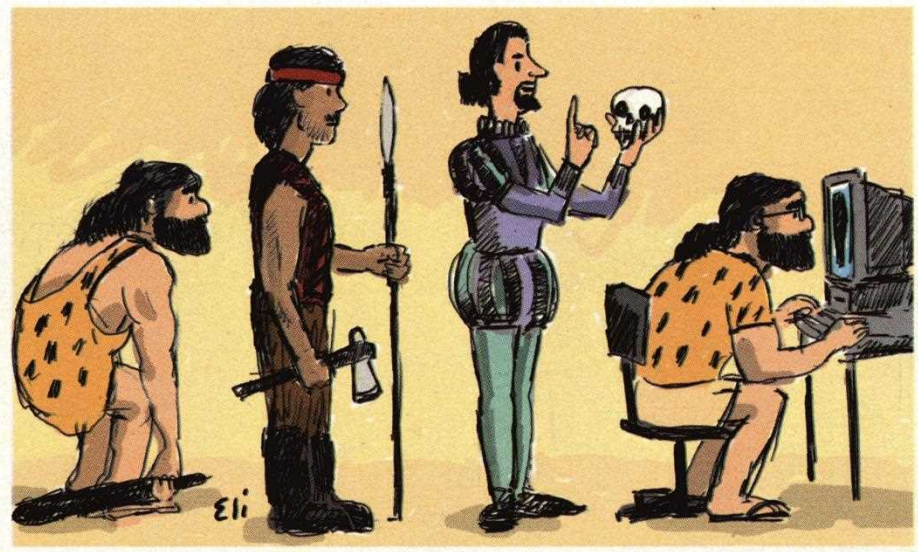
Is Apple a reliable long-term source, or are we going to end up with a bunch of expensive, obsolete Macs?

Apple's been making Macs for 11 years. It beats most PC cloners by a long shot. A better question might be: How long will Dell Computer Corp., AST Research Inc., Zenith Data Systems Corp. or Gateway 2000 Inc. be around? These guys are working on tighter margins than Apple, and they don't control their operating system. With Mac clones expected to grow the Mac OS market, Apple's in an even better growth position.

We are currently paying a premium in cost for Macs. Why should we?

You shouldn't. First, make sure you are comparing Mac and PC models of similar performance. If so, renegotiate your purchase contracts. □

Don Crabb welcomes comments at his Internet address decc@cs.uchicago.edu. You can also check out his home page at http://cs-www.uchicago.edu/~decc/.



The Stone Age *The Iron Age* *The Age of Enlightenment* *The Information Age*

Comments? Ideas? Contact Eli at elitoons@aol.com

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Your mind
Is racing.
Your fingers
Are racing
To keep up
With your thoughts.

YOU WRITE

You begin
A new
Sentence with
A lowercase letter.
This mistake
Is corrected
Automatically.

YOU REVISE

Knowing there are
100 levels
Of Undo.
And 100 levels
Of Redo.
Just in case.

YOU WRITE

You begin a new
Sentence with -
An abbreviation
You created.
It becomes
An entire phrase.
Automatically.

YOU REVISE

In
Print preview
You change
Margins
Words
Typefaces.

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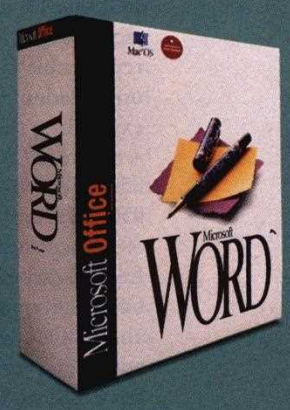
Until you have finished.
You click AutoFormat.
And the block of words
Can become
A letter.
A proposal.
A story.
Automatically.
You write. Because you can.



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POWER SURGE!

While the Power Mac line has seen spectacular success so far, many have been waiting for its 604 and PCI incarnation — for the *real* Power Macs. This week, the first wave of the second generation arrives. Our in-depth review of the 9500 also notes OS changes, takes a first look at PCI cards and comments on what the machine means to the publishing market.

ED CALDWELL

The Power Mac 9500: A RISC worth waiting for

By Henry Norr and Bruce Fraser

Among the dozens of Macintosh models that have appeared over the years, only a handful — notably the Mac II in 1987 and the first-generation Power Macs last year — marked real turning points in the platform's evolution. The Power Mac 9500, the new model Apple is rolling out this week, may not belong in that select company, but it comes close.

Out of the box, the 9500 — previously known by its code name, Tsunami — delivers a substantial improvement in performance at no increase in cost, compared with the current top-of-the-line system, the Power Mac 8100/110. More importantly, the new machine brings a slew of new technologies — the PCI bus, Open Transport networking architecture, QuickDraw acceleration hooks and a replaceable CPU card — that will give users unprecedented flexibility in configuring and expanding their systems to meet their needs.

In the U.S. market, Apple will offer the 9500 in two configurations. The $5,799 9500/132 will include a 132-MHz PowerPC 604 processor, 16 Mbytes of RAM, a 512-Kbyte Level 2 cache, a 2-Gbyte hard disk, an AppleCD 600i quadruple-speed CD-ROM drive and six PCI expansion slots. Users will need to add a PCI video card because the 9500 logic board has no built-in display capabilities. The $4,999 9500/120 will sport a 120-MHz 604, 16 Mbytes of RAM, a 512-Kbyte Level 2 cache, a 1-Gbyte hard drive, the AppleCD 600i and the single-connector PCI graphics card, manufactured for Apple by ATI Technologies Inc. of Thornhill, Ontario. As shipped, the card will have 2 Mbytes of video RAM delivering 24-bit color at resolutions of 640 by 480 pixels and 832 by 624 pixels, 16-bit ("thousands of colors") at 1,024 by 768 pixels and 1,152 by 870 pixels, and eight-bit color at 1,280 by 1,024 pixels. With the addition of a $249 ATI daughtercard carrying two more megabytes of VRAM, you can get 16-bit color at 1,280 by 1,024 pixels and 24-bit color at the lower resolutions.

The system we evaluated was a late prototype that had obviously been assembled manually. It included a 132-MHz processor, 112 Mbytes of RAM, a 1-Gbyte Quantum Empire hard drive and an AppleCD 300 Plus CD-ROM drive that did not work.

The box

At a glance, the 9500 looks anything but revolutionary. It closely resembles the Power Mac 8100, except that it is 3 inches taller and the power-on button has moved from the rear to the bottom-right front corner, where it replaces the programmer's switches. In addition to the usual SCSI connector, AAUI (Apple attachment unit interface) for Ethernet transceivers, modem and printer ports (both GeoPort-capable), Apple Desktop Bus connector, and 16-bit sound-in and sound-out ports, there's a separate 10BASE T port, for which no transceiver is necessary. At last, Ethernet is truly plug-and-play! (You can have cables plugged into both Ethernet ports simultaneously, but only one can be active at a time, until a later revision of Open Transport.)

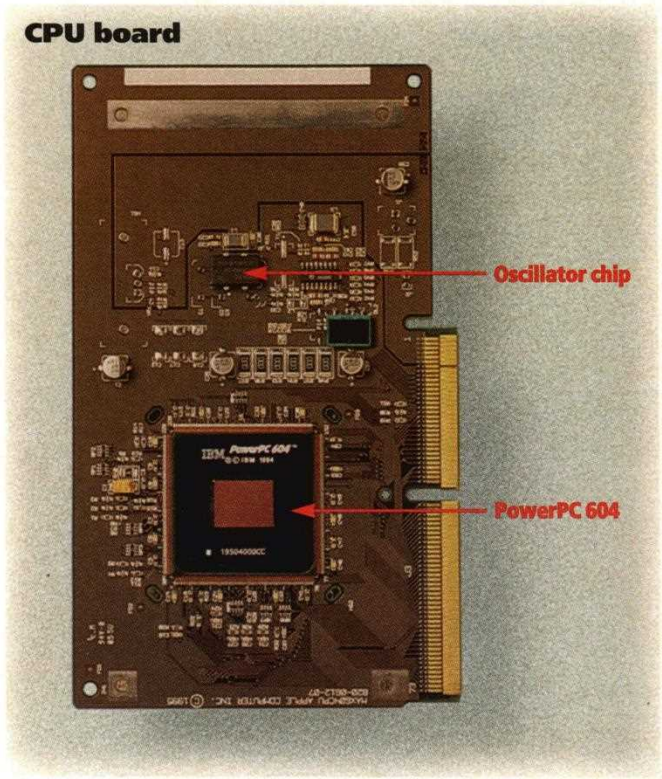
Inside, too, the 9500 design is familiar. Below the 5.25-inch bay for the CD-ROM drive are bays for the floppy drive and built-in 3.5-inch hard drive, plus an empty bay that can hold one half-height or two one-third-height 3.5-inch drives. Two separate SCSI buses are available: The internal bus is Apple's first true implementation of 10-Mbps Fast SCSI; the so-called external bus, which has both internal and external connectors, is rated at 5 Mbps. The speaker and a 220-watt power supply are at the rear.

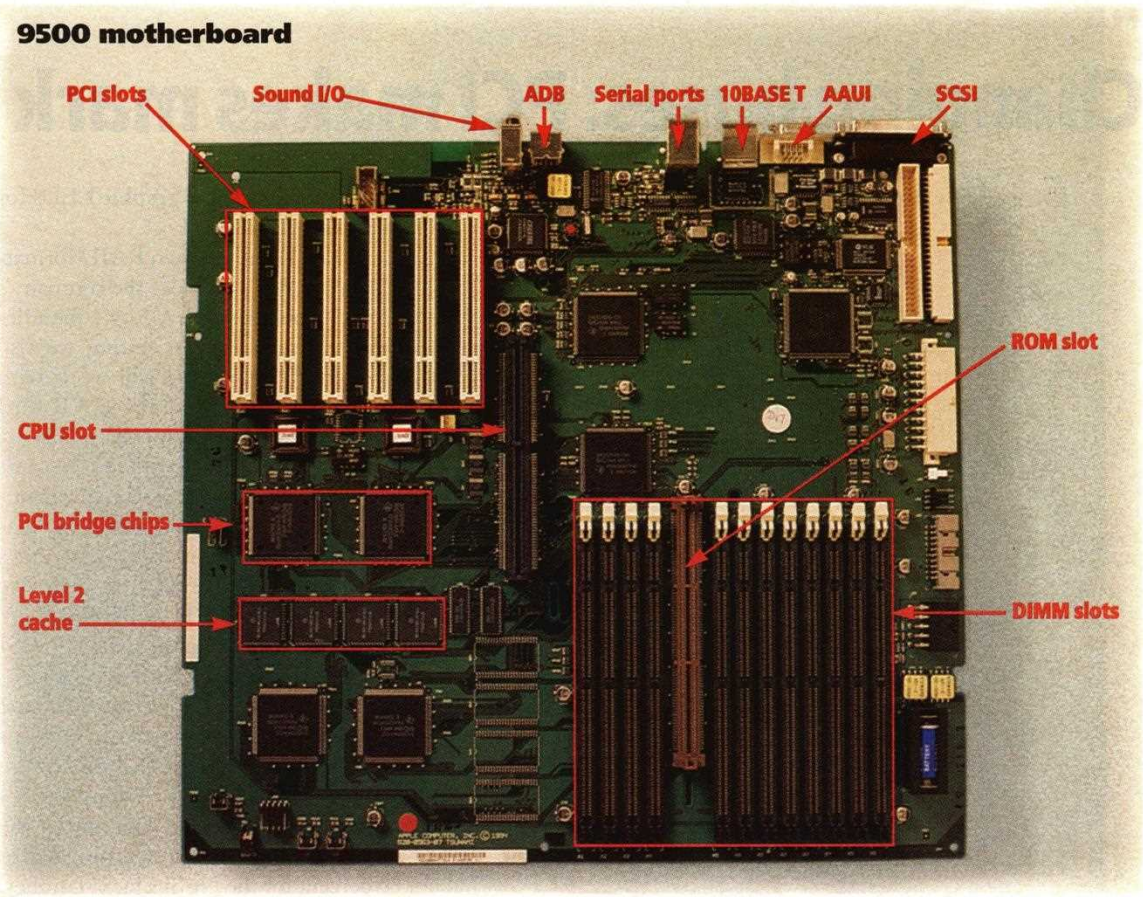
The board

The real innovations in the Power Mac 9500 are what's on — or, in the case of the CPU, what's not on — its logic board. The 604 processor is on a videocassette-size daughtercard that slides into a special slot at the center of the logic board. Upgrading to a faster processor or possibly, with future versions of the Mac OS, dual processors will be a simple matter of plugging in a replacement daughtercard. The cards contain no proprietary Apple circuitry, so users should eventually have a choice of third-party upgrade options.

One note of caution: The 9500's system bus is designed to run at a maximum frequency of 50 MHz. The lowest "clock divider" — the ratio of system bus frequency to processor frequency — supported by the current 604 chip is 1-to-3. (The system bus runs at 40 MHz and 44 MHz, respectively, in the 120- and 132-MHz models.) This implies that the CPU can be upgraded only to 150 MHz. It may, however, be possible to upgrade to higher speeds if future versions of the 604 offer lower clock dividers or if Apple or others address the issue with additional circuitry on the daughtercard.

The PowerPC 604 not only runs at faster speeds than the original 601 chip, but also ac-





complishes more on each cycle, chiefly because it has three integer-execution units (two general-purpose and one for instructions that require multiple cycles to execute). In theory, the 604 is supposed to offer up to one and a half times the integer processing power of a 601 at the same clock speed, but our tests suggested a more modest improvement is typical (see benchmarks, Page 34). The 9500/132 was only 12 percent faster than a Power Macintosh 8100/110 running a complex Microsoft Excel 5.0a macro but was almost two and a half times faster on an Adobe Photoshop 3.0 Gaussian Blur. Compared to the more common Power Mac 8100/80, the 9500 proved about twice as fast in most real-world tests.

The 9500's 4-Mbyte ROM includes Apple's Dynamic Recompilation Emulator, a new technology that speeds execution of 680x0 instructions by caching blocks of translated code in memory. Apple officials have long since backpedaled from early talk that the improved emulator would deliver up to twice the performance of its predecessor, but we were surprised when MacBench 2.0 reported a slight *decline* in processor performance in emulation mode compared to an 8100/110 with the original emulator. Real-world application performance was more encouraging; we found that a processor-intensive search-and-replace test in Microsoft Word 5.1a was about one and a half times as fast as the 8100/110, and video-intensive scrolling tests were almost three times as fast.

Memory

The Power Mac 9500 logic board has no soldered-on memory, but it has 12 RAM slots, which with current technology can accommodate up to 768 Mbytes of memory. Instead of SIMMs, the machine uses DIMMs (dual in-line memory modules), a new standard established by the Joint Electron Device Engineering Council (JEDEC). Apple and other vendors of workstations and high-performance personal computers are adopting the new format because the 168-pin DIMM modules can deliver data to the processor 64 bits at a time, compared with 32 bits from 72-pin SIMMs. According to Apple officials, the change was necessary to take advantage of the 9500's 64-bit data bus and get full performance out of the speedy 604 processor.

DIMM capacities will range from 4 Mbytes to 128 Mbytes, and you'll be able to install them singly in any combination. When you install identical DIMMs in pairs, however, the Power Mac 9500's custom memory controller will automatically interleave their data, allowing the CPU to read 128 bits in a single operation.

The switch to yet another memory format is bound to generate some frustration, especially in graphics and publishing, where users' investment in RAM is often several times the cost of the Mac itself. Fortunately, at least one third-party vendor will offer a solution; Newer Technology of Wichita, Kan., has developed a device called the DIMM Tree, a $69 adapter that accepts two matching low-profile 72-pin SIMMs up to 32 Mbytes each and essentially turns them into a single DIMM. According to Newer, there will be no performance penalty, and in some cases no other DIMM slots will be blocked, although users who wish to adapt more than four SIMMs will be forced to block slots.

As with the 8100, adding memory to the 9500 is absurdly complicated and time-consuming. You must disconnect every cable plugged into the logic board, ports and add-on cards — typically at least a dozen cables in all — and remove every card, including the CPU daughtercard and whatever PCI video card you have installed. It's disappointing to see this user-hostile design perpetuated in Apple's fourth generation of minitowers.

New bus replaces NuBus

The biggest single change the 9500 brings to the Mac architecture is the replacement of NuBus by PCI. The 9500 actually has two PCI buses, each with three slots and its own controller, a custom Apple PCI bridge chip called the Bandit. The PCI bus operates at 33 MHz, compared with 10 or 20 MHz for NuBus, and it's capable of real-life through-

See Review, Page 34

System 7.5.2 gets the Mac one step closer to Copland

By Henry Norr

Just as the Power Mac 9500's hardware design represents an intermediate stage between the original Power Mac architecture and future systems based on the Common Hardware Reference Platform, the new machine's system software — System 7.5.2 — marks a milestone in the evolution of the Mac OS toward Copland. While it retains the look and feel of System 7.5 in most respects, it brings support for the latest Power Mac hardware, some appreciable performance improvements and at least one significant architectural change to the system.

▶ **Hardware support.** The first priority for this release, which Apple says is designed for and tested on only the 9500 and its upcoming siblings, was to support the new hardware it will introduce, notably the PowerPC 604 processor and the PCI bus.

Supporting the 604 (and the 603) required making the system "POWER-clean" — that is, replacing instructions that came from IBM Corp.'s old POWER architecture (predecessor of the PowerPC) and were supported in the PowerPC 601 but are not included in later versions of the chip. (The 9500 ROM provides emulation of these instructions to ensure compatibility with any third-party products that use them, but such emulation imposes a performance penalty.)

Controlling interactions with the PCI bus is a

See System 7.5.2, Page 36

FIRST LOOK

Changing buses: PCI makes mark

By Bob O'Donnell

Probably the most exciting and important change in the Power Macintosh 9500 is its inclusion of the PCI bus for data I/O and system expansion. Early experience suggests that PCI will deliver on its promise of faster throughput at lower prices.

We tested two beta SCSI accelerators from FWB Inc. of Menlo Park, Calif., and QLogic Corp. of Costa Mesa, Calif., as well as the ATI Technologies Inc.-designed graphics accelerator Apple will offer with certain configurations of the 9500 and that ATI of Thornhill, Ontario, will sell separately as the Xclaim GA. Our results, particularly in light of the targeted pricing, were very encouraging. The $449 ATI video card ($649 for a 4-Mbyte version), in particular, offers performance better than the fastest NuBus accelerators for less than 20 percent of the price (see Review, Page 28).

The SCSI accelerators also offer more for less; FWB's $499 PCI JackHammer and QLogic's $495 Fast!SCSI MAC PCI-W maintained data transfer rates up to 2.5 times faster than a $599 (formerly $799) NuBus JackHammer installed in a Quadra 840AV attached to the same RAID Level 1 drive.

Getting all SCSI

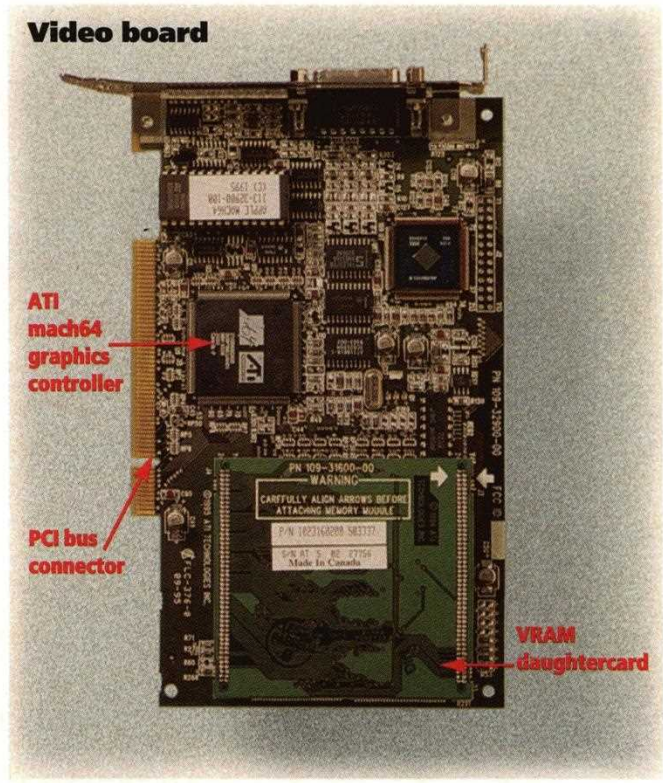
Both the FWB and QLogic SCSI accelerators are based around the same QLogic PCI-to-SCSI RISC chip, and both support the Fast and 16-bit Wide versions of the SCSI-2 standard. In fact, except for a few minor differences, the boards look nearly identical. Both cards offer a 68-pin SCSI-2 Wide connector on the back and 68-pin SCSI-2 and 50-pin SCSI connectors on the inside for internal ribbon cables.

The FWB card includes graphic LEDs for diagnostic purposes as well.

Each card ships with its own RAID formatting software; FWB's includes the company's Hard Disk Toolkit, and QLogic bundles CharisMac's Anubis. In our testing we also found that the QLogic card will work with FWB-formatted drives, but the FWB card does not work with Anubis-formatted drives.

The performance characteristics of the cards and the driver software were essentially identical. Using Verisys Inc.'s SCSI-View SCSI Analyzer to check the SCSI bus as we copied files from the 9500 to an FWB 4-Gbyte array, we saw burst transfer rates of 16 to 18 Mbytes per second when using either of the two PCI SCSI accelerators. In contrast, the NuBus SCSI JackHammer attached to the same array had burst transfer rates of 9 to 12 Mbytes per second. Interestingly, we found that the PCI cards were more efficient than the NuBus versions; the PCI cards spent about 99 percent of their time on the SCSI bus performing data transfer compared to about 80 percent for the NuBus JackHammer.

Real-world sustained transfer rates when copying a 100-Mbyte Adobe Photoshop file from one array to another identical one through both cards was 4.1 Mbytes per second, compared with 1.7 Mbytes per second when copying the same file from the internal disk (which sits on the Fast, but not Wide, internal SCSI bus) to a 1-Gbyte FWB drive attached to the slower external SCSI bus. Throughput when copying the same file from the internal drive through either card to the FWB RAID was 2.4 Mbytes per second. On the 840AV, copying from the external drive through the NuBus JackHammer to the RAID showed a transfer rate of 1.7 Mbytes per second.



NuBus to PCI

While the change to PCI is encouraging, it could be a sore point for current users because NuBus cards will not work in the 9500. Users with big investments in existing cards, however, can turn to Second Wave Inc. It will be offering two-, four- and eight-board NuBus expansion cages and a PCI adapter that plugs into the 9500 and lets you use your old cards. We weren't able to test the system for compatibility and performance, but the company claims the cage/board combinations will offer similar performance to existing NuBus-based Power Macs. □

Testing was performed by Brian Berg of Berg Software Design (bberg@bswd.com), Eric Swartz of Verisys Inc. (erics@cruzio.com), and Jim Mullin (jim@mullin.com).

COMMENTARY ANITA MALNIG

Simultaneous screaming

This 9500 is going to scream for whoever uses it (see Review, Page 28), but Apple has its eye on what this fast machine will do for the publishing market. It's clear from the co-marketing Apple has done with the PCI vendors that the targeted customers are in pre-press and publishing; digital video is a close second.

To answer those naysayers who yap on about how the Mac's fate is to remain a niche machine for graphics, Apple is making good on its promises to the $2 billion-to-$5-billion publishing/pre-press market, a "niche" most of us would like to own. This is big business, folks, not some creative group of high-strung art directors fussing over a vodka ad.

Besides delivering a fast machine, what is Apple promising? Does the industry want it?

At the very least, Apple says the Power Mac 9500 replaces the Quadra 950, which was Apple's most popular pre-press and publishing machine. It offered speed, the highest degree of customization and a robust power supply.

In fact, there are pre-press departments that still haven't upgraded their 950s because some prescient folks saw the Power Mac 8100 as a transitional product.

So not only does the 9500 offer respectable speed increases — our tests showed two and half times faster on an Adobe Photoshop Gaussian Blur — third-party PCI products promise operations people at pre-press houses the chance of a fulfilling life rather than waiting forever while large files load and transfer from station to station. Plus imagine working quickly in CMYK with a $2,000 board (from Radius Inc.) that in its NuBus life was close to $4,000.

So, what's not to like?

The machine is faster, more customizable and can accommodate up to 768 Mbytes of RAM. For some, that's plenty. For others, the time has come to be able to do these operations simultaneously, to multiprocess without time-share slowdown.

Why can't I, asks one very high-end pre-press fellow, hit Print in QuarkXPress and process a four-color separation, switch to the Finder and copy a 300-Mbyte file from the server to the local drive, and, as that executes, go to work in Adobe Photoshop in real time? His is not a lone cry in the wilderness.

Luckily for Apple, many pre-press people don't like Unix.

Do these significant needs signal a move to Unix machines for multiprocessing, as some worried about the Mac's future suggest? Not really — yet. Luckily for Apple, many pre-press people don't like Unix, don't want to take on the training it would demand and just like their Macs. (Unix servers for pre-press is another issue entirely, one that I won't go into now.)

As for multiprocessing, enter DayStar Digital Inc. — make that Apple and DayStar. Not only will DayStar be offering its own box, the Genesis MP — based on Power Mac 9500 technology — the company is planning its nPower cards for the PCI Macs, replacement CPU cards that will support two 604 chips. Additionally, DayStar is developing the accompanying multiprocessing software for Apple. So this tells me that even though Apple needs to better synchronize its hardware and software (read Copland, Gershwin) the company is moving in the right direction by recognizing that it can't all be done in-house.

If Apple wants to lock in the publishing industry, bring on board the digital video industry and capture publishers expanding from print, it made quite a start with the 9500. Fast is great. Executing multiple tasks simultaneously is better. □

Anita Malnig is MacWEEK executive editor/features and welcomes feedback at anita_malnig@macweek.ziff.com.

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You ask What if?

You get answers.

You make progress.

SPREAD THE WORD

Show your plan

Show who

What

When

Where

How

Things will get done.

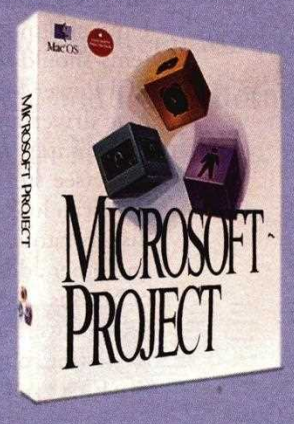
GET GOING

Show how much

Progress has been made

Show everyone

That nothing stands in their way.



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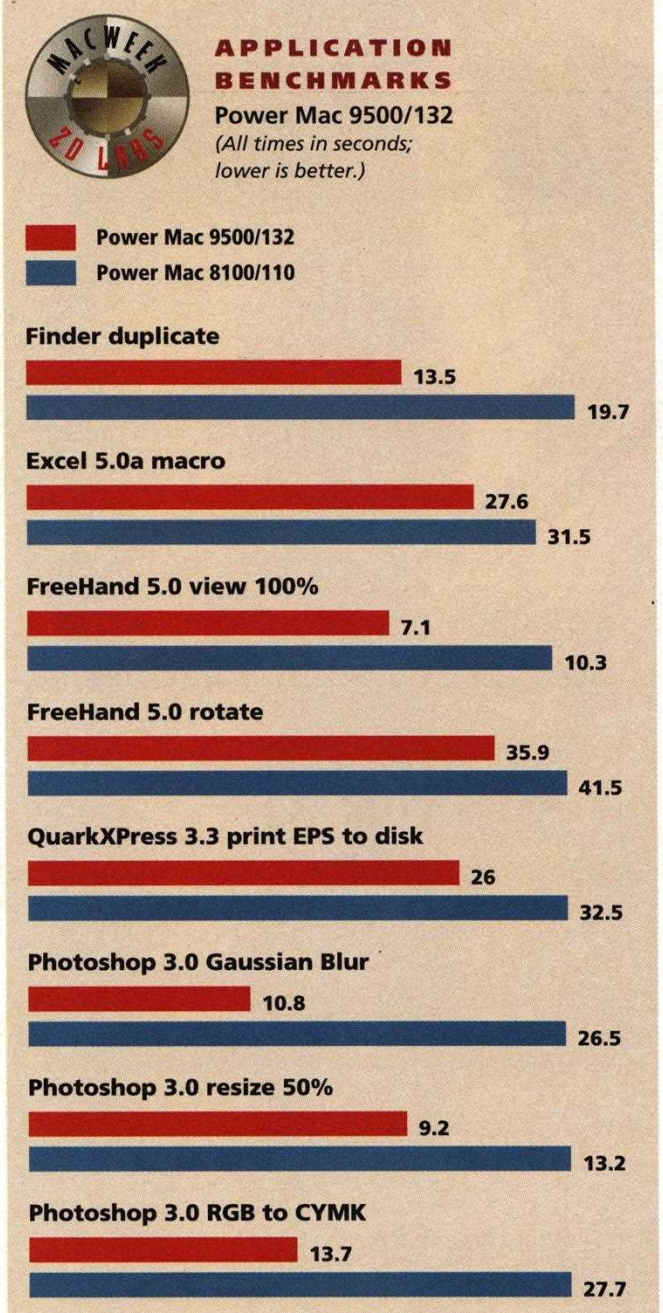

Tests were performed on a preproduction 9500 with 112 Mbytes of RAM running System 7.5.2 and a standard 8100 with 80 Mbytes of RAM running System 7.5.1. The Finder duplicate used an 18-Mbyte file; the Excel macro used a 1-Mbyte data file; the FreeHand tests used a beta of Version 5.1 on the 9500 and 5.0 on the 8100 with a 3-Mbyte file; the XPress file was 8 Mbytes; and the Photoshop tests used a beta of Version 3.0.4 with an 18-Mbyte Photo CD image.

Review

From Page 29

put of up to about 100 Mbps — several times more than the NuBus could handle.

But the biggest advantage of PCI is that it's already a standard among Pentium-based systems, and most cards designed for those systems should work without modification on PCI Power Macs; developers need add only a Mac driver and, in some cases, boot ROMs that comply with the Open Firmware standard (see story, Page 29). That means Mac users can look forward to a wide selection of display cards, Fast and Wide SCSI adapters and other add-ons at prices well below those of NuBus cards. Only a handful of PCI-card vendors were able to send us products in time for testing, but the results were encouraging (see First Look, Page 30).

Open Transport

The 9500 is the first Mac to ship with Open Transport, Apple's new networking software architecture. Key features include new, PowerPC-native AppleTalk and TCP/IP stacks, with other protocol stacks to follow from third parties; multihoming, a capability that will allow users to maintain AppleTalk connections on several ports (normally LocalTalk and Ethernet) simultaneously; a simplified user interface for networking configuration; a standards-based programming interface that will enable developers to write network applications without worrying about the details of particular protocols; and backward compatibility with older network applications and drivers.

The new scheme, according to Apple, lays the groundwork for a significant increase in Mac networking performance. Our testing, however, did not reveal such improvements. When copying data to and from an AppleShare server over Ethernet — using both the built-in 10BASE T port and Asanté Technologies Inc.'s FriendlyNet 10T Adapter plugged into the AAUI — throughput was indistinguishable from a Power Mac 8100/110 with the same Asanté adapter on the AAUI. According to Apple, significant improvements won't happen until Open Transport 1.1 ships in the fall.

Compatibility

In our limited testing, we uncovered very few compatibility problems either with applications or with utilities. Key publishing utilities, such as Adobe Type Manager 3.8.2 and Symantec Corp.'s Suitcase 2.1.4p3, ran without a glitch, as did Now Software Inc.'s Now Utilities' NowMenus and SuperBoomerang. More importantly, so did most of the applications we tested, including Adobe Photoshop 3.0.1, QuarkXPress 3.3.1 and Macromedia FreeHand 5.0.

Given the changes in the file system to support larger volumes (see story, Page 29), most disk-formatting and file-recovery utilities, such as Symantec Corp.'s Norton Utilities 3.0.1 and MacTools Pro 4.0, are likely to require updates. Our tests with those applications offered mixed results; we were able to optimize the internal disk of our prerelease 9500 with MacTools Pro but had difficulty recovering deleted files. Symantec officials said updated versions of both programs are scheduled for a summer release.

In a few cases, we found some operations that ran more slowly on the 604 than on the 601. Arbitrary Rotate in Photoshop 3.0.1 was one such example. According to Apple and third-party vendors, there are basically two situations that can cause this. Data structures that aren't correctly aligned for 128-bit transfers can slow the machine down, and 601-specific POWER instructions are emulated on the 604, hindering performance. Both are relatively easy to fix. We tested a beta version of Photoshop 3.0.4 that cured the Arbitrary Rotate problem and picked up another 5 percent to 10 percent on some filter operations.

Basically, it seems safe to conclude that most applications will run without modification on the 604 and will need only slight changes to deliver serious performance improvements.

Subjectively, the 9500 feels extremely fast, in part because of the very speedy PCI video. Video system benchmarks can be misleading, and for most real-world applications the video system simply isn't a bottleneck, but any way you measure it, the Apple/ATI PCI video card is considerably faster than any previous solution available on the Mac — perhaps almost twice as fast — at a fraction of the cost of current state-of-the-art accelerated video cards for the NuBus.

Disk performance is also considerably improved. The Quantum Empire drive that came in our test machine is a respectable but by no means spectacular performer, yet it duplicated an 18-Mbyte file in the Finder in only two-thirds of the time the 8100/110 and its IBM 1-Gbyte drive required.

But the biggest factor in the 9500's performance is undoubtedly the 604 chip. Processor-intensive applications such as Photoshop really fly on the 9500. In a wide-ranging series of tests with the program, we found the 9500 outdoing the 8100/110 by 50 percent to 150 percent in most time-consuming operations. On notorious Photoshop bottlenecks, such as Unsharp Masking, Feathering selections and RGB-to-CMYK conversion, the 9500 was at least twice as fast as the 8100/110.

A digital signal processor-accelerated Power Mac 8100/80 still outpaced the 9500 significantly on operations such as rotation and accelerated filters. But the 9500 handily outperformed every Pentium system we've tested with Photoshop, including a system with dual 100-MHz Pentiums running Windows NT.

On other applications, we experienced more modest but still significant speed gains. A complex blend in Illustrator 5.5 was almost twice as fast on the 9500 as on the 8100/110, while various operations in Fractal Design Corp.'s Painter, such as Sharpen and Apply Surface Texture, offered improvements in the 50 percent to 80 percent range. An XPress 3.3 Print EPS to disk test showed about a 20 percent improvement. Word 6.01 was about 25 percent faster on most operations.

In the worst cases — a FreeHand rotate and an Excel macro — the speed increase over the 8100/110 was less than 15 percent. We look forward to running more exhaustive benchmarks on a shipping machine; if the speed improvement on processor-intensive applications for time-consuming tasks such as trapping and imposition is in the upper end of the range we've

See Review, Page 36

CPU QUICK FACTS

Company	Apple
Model	Power Macintosh 9500/132
CPU	132-MHz PowerPC 604
Configuration	16/2,000/CD (quadruple-speed)
Slots	Six PCI, one CPU
Memory	12 168-pin DIMM slots; two 8-Mbyte DIMMs fill two slots
Video	None standard; up to 24-bit at 1,280 by 1,024 pixels with optional video card and extra VRAM
MacBench 2.0 CPU score	61
Bundled hardware	Apple extended keyboard, mouse
Bundled software	System 7.5.2
Additional features	512K Level 2 cache, CPU can be upgraded, 10BASE T Ethernet port
Price	$5,799; $4,999 for 9500/120 16/1,000/CD (quadruple-speed) w/ 2-Mbyte video card

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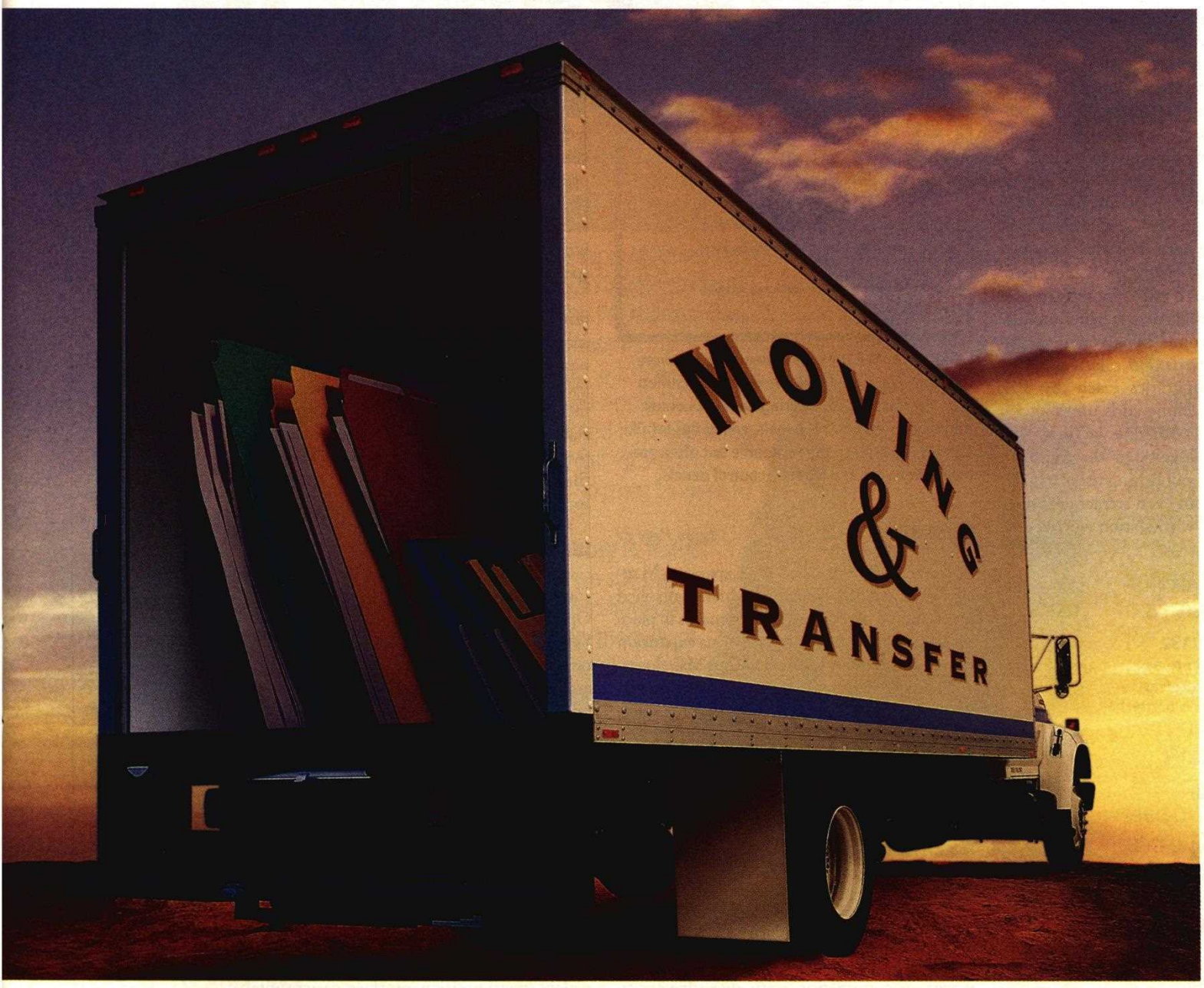

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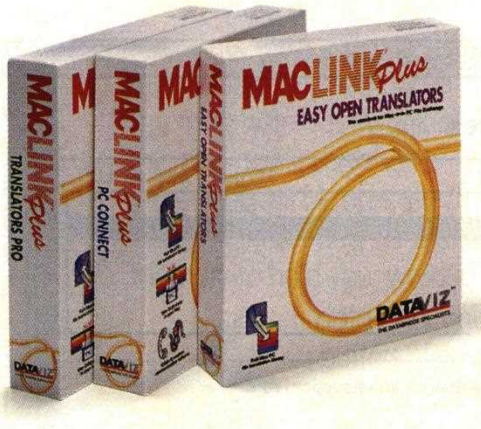

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Review

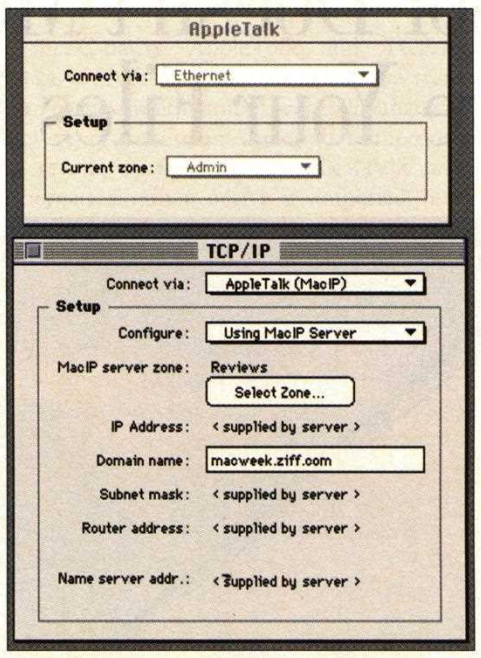
From Page 34

seen so far, the machine should appeal strongly to the target graphics and publishing market. For Photoshop users, it's clearly a slam-dunk.

Conclusions

Compared with the Power Mac 8100/110, the 9500 offers a substantial, if not exactly breathtaking, performance boost. But since the 8100/100 and 110 have been so difficult to get, it may be more meaningful for most users to compare the 9500 to the 8100/80, and in that perspective the new machine looks more like the breakthrough Mac users had hoped for from the PowerPC 604 and PCI. That's all the more true when you recall that an 8100/80 with 16 Mbytes of RAM, a 1-Gbyte hard disk and a double-speed CD-ROM drive carried an ApplePrice of $6,159 when it appeared just 15 months ago.

Considering that the greatest benefits of the 9500 are yet to come, when new high-performance PCI cards and relatively inexpensive processor upgrades reach the Mac market, the new machine adds up to a long step forward for the Mac, one we think will not only reinforce loyalty to the platform among graphics and publishing users who already use the Mac, but even attract new buyers from the PC and workstation worlds. □



Open Transport, the new networking software that ships with the 9500, provides a simplified user interface for configuring network connections. Two new control panels, called AppleTalk and TCP/IP, replace the venerable but often confusing Network and MacTCP control panels.

System 7.5.2

From Page 29

new system facility called the Expansion Manager. The old Slot Manager, which controlled interaction with NuBus cards, remains in place for use with Second Wave's NuBus expansion chassis and possibly future dual-bus Mac clones.

The new system also supports Open Firmware, an industry-standard scheme for starting up the computer independently of the OS. In addition to laying the groundwork for future machines where users will be able to choose from among several operating systems, Open Firmware provides a mechanism for PCI cards to install necessary drivers in memory and to alert the OS to their presence, capabilities and requirements.

▸ **More native code.** System 7.5.2 also includes native PowerPC versions of two major OS components: the SCSI Manager, which works in conjunction with disk drivers to read and write data on SCSI devices, and the Resource Manager, which controls low-level access to such system resources as fonts, menus and dialogs. Since both of these managers are called frequently by both applications and other parts of the OS, making them native significantly improves the responsiveness of the new Power Macs, especially with native applications.

Unfortunately, however, other system components that make disk I/O a bottleneck on all Power Macs — particularly the File Manager — have not yet been ported and modernized. To take full advantage of the 9500's I/O hardware subsystem, users will have to wait for the Copland release of the Mac OS.

▸ **Large-volume support.** The new system replaces System 7.5's 4-Gbyte limit on volume size with a 2-terabyte maximum — well beyond the size of any current drive. Several caveats apply, however: File size is still limited to 2 Gbytes; volumes larger than 4 Gbytes require updated drivers and will not mount on machines running pre-7.5.2 versions of the Mac OS or any machine with the Mac's original 68000 processor; and the Mac file system's allocation-block scheme, which becomes highly inefficient on large volumes, has not been changed. (On a 2-Gbyte volume, even the smallest file takes a minimum 32 Kbytes; on a hypothetical 2-terabyte volume, even a tiny text file would consume 32 Mbytes.)

Here, too, users will have to await Copland for a more complete fix to problems with the Mac file system.

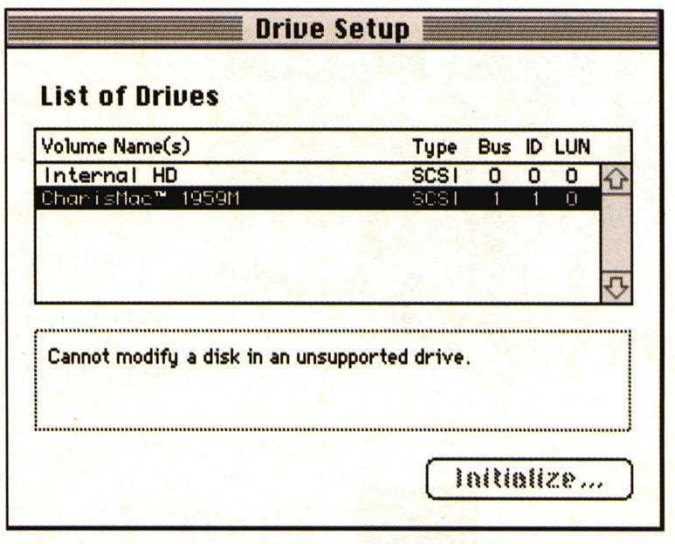
▸ **Improved emulator.** The new system incorporates Apple's Dynamic Recompilation Emulator, a long-rumored enhancement to the technology the original Power Macs use to execute 680x0 code on the PowerPC. Whereas the original emulator is interpretive — it translates 680x0 instructions each time they're used — the Dynamic Recompilation Emulator caches blocks of translated 680x0 code in memory for speedier execution the next time they're called.

▸ **Other performance improvements.** System 7.5.2 provides new BlockMove commands that enable applications, especially native PowerPC code, to shift data in memory more quickly. In addition, the new release incorporates performance improvements recently delivered for other Macs through System 7.5 Update 1.0. These include faster file-sharing code and a dramatic speedup for some floating-point math routines.

▸ **Open Transport.** For users and network administrators in sites with large and complex networks, Open Transport, System 7.5.2's all-new networking architecture, will probably prove its most significant advance (see MacWEEK, Feb. 6, Page 10).

> For users and network administrators in sites with large and complex networks, Open Transport will probably prove to be System 7.5.2's most significant advance.

Among other benefits, it promises sharp performance improvements from native implementations of AppleTalk and TCP/IP, a streamlined but scalable configuration interface, easier switching among protocols, and support for central administration over the network. □

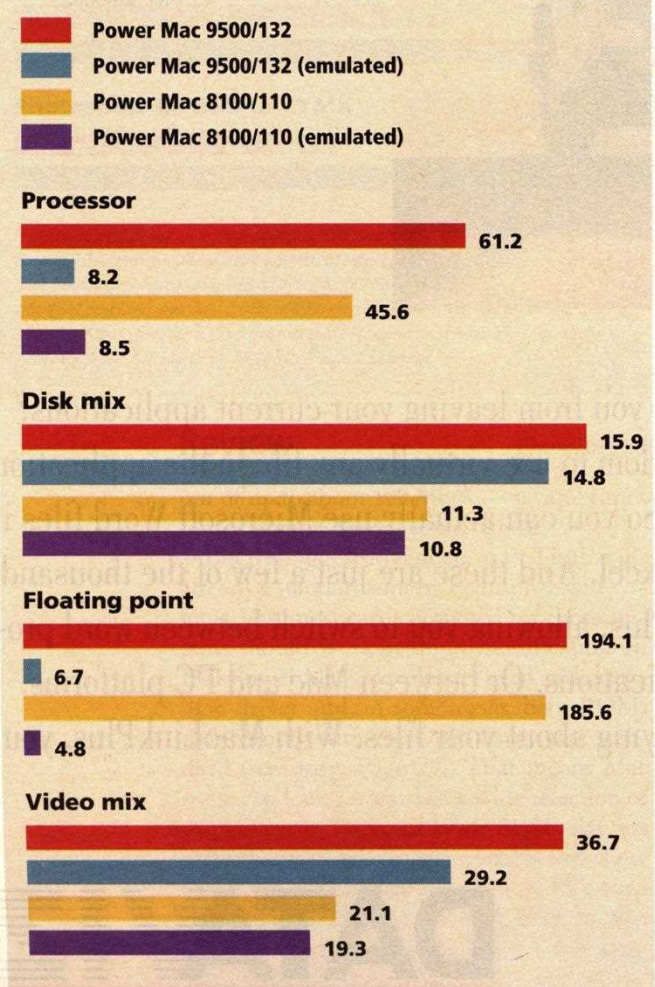

Drive Setup
List of Drives
Volume Name(s) Type Bus ID LUN
Internal HD SCSI 0 0 0
CharisMac™ 1959M SCSI 1 1 0
Cannot modify a disk in an unsupported drive.
Initialize...

Included with System 7.5.2 in the Power Mac 9500 is Drive Setup, a new disk-formatting utility that finally replaces the venerable HDSC Setup. In addition to adding support for volumes larger than 4 Gbytes, it delivers a streamlined user interface, the option of creating multiple HFS partitions and support for removable media.

MACBENCH 2.0

Power Mac 9500/132

(All results in relation to a Quadra 630, which receives a score of 10; higher is better.)



Tests were performed on a preproduction 9500 equipped with a 1-Gbyte Quantum Empire drive and a standard 8100 with a 2-Gbyte IBM drive. System 7.5.1 was used on the 8100 and a beta of System 7.5.2 on the 9500 with Extensions Manager defaults. Video resolution was 640 by 480 pixels with 256 colors.

Six Things *Not* To *Forget* When Buying *Memory.*

How much more memory do I really need? With the right amount of RAM, more applications can be opened simultaneously, large files and databases can be searched (at about 1000 times the speed of the fastest rotating disk drive), and your Mac is a performance maniac. Without the right amount of memory your Mac is slow, cranky, and may send you messages like "Application could not be opened", or worse, "Application has quit unexpectedly". Not good.

Memory Worksheet

6 MB	System 7.0
8 MB	Adobe Illustrator
8 MB	QuarkXPress 3.3
22 MB	**Software Memory**
8 MB	Data, Buffers, etc.
30 MB	**Total**

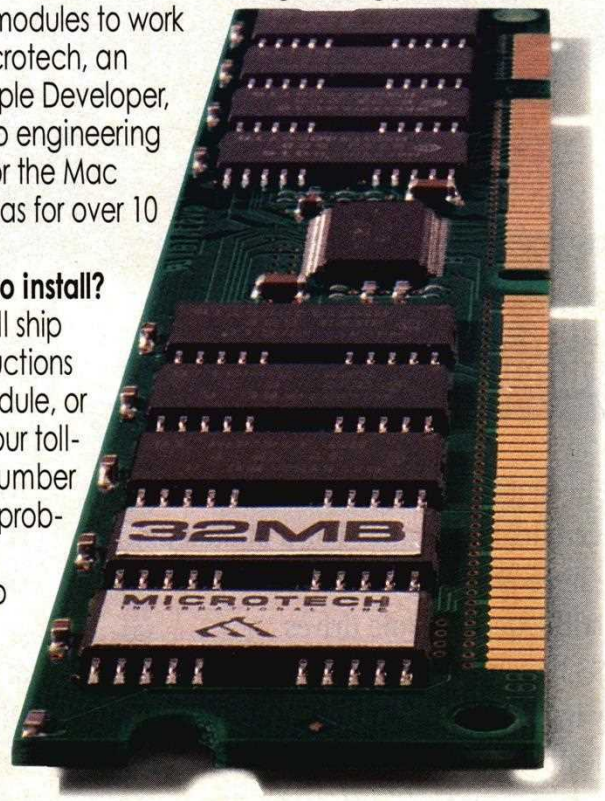
To figure out your true memory needs, add up the recommended memory for the most system software, utilities and application software that will be opened at one time, then add sufficient memory to hold your working data and "undo" buffers. If you need help, send for our free Memory Survival Guide.

Authorized Apple Developer ®

Is it made by Mac specialists? With few exceptions, most memory suppliers create and sell about 90% of their modules to the PC market, then modify these modules to work on a Mac. Microtech, an Authorized Apple Developer, is dedicated to engineering memory just for the Mac market. And has for over 10 years.

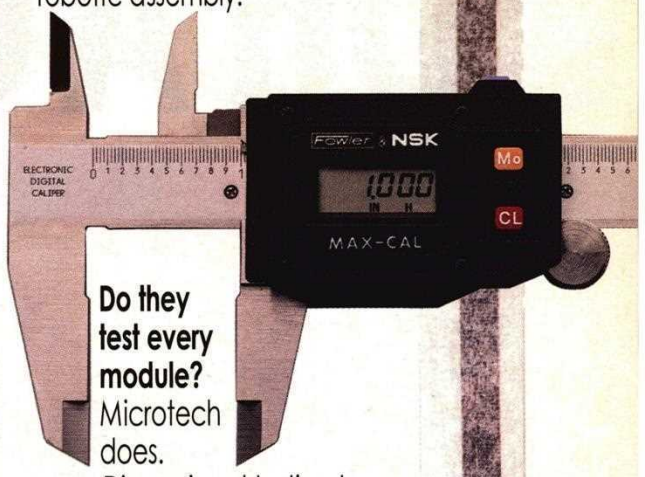
Is it easy to install? Yes, but we still ship detailed instructions with every module, or you can call our toll-free support number if you run into problems. We also make it safe to install. Microtech includes an anti-static wrist band so you don't accidentally zap your memory during installation.

Is it made for my type of Mac? Since we have an "engineering partnership" with Apple, every Microtech module is designed for a specific Macintosh. For example, our PowerMemory™ takes full advantage of the RISC processor inside the Power Mac with features like optimized refresh for improved efficiency, and a lower chip count for higher reliability. Unlike most suppliers, we only use self-refresh DRAM in our Coyote™ memory to protect against loss of data when your PowerBook goes to sleep.



DIMMs available

And all our modules use a minimum four-layer printed circuit board with separate power and ground planes to protect your data, fast page dynamic RAM, and precision robotic assembly.



Do they test every module? Microtech does.

Dimensional testing to assure quality assembly. Electrical testing to ensure there are no weakened components that will cause problems in the future. And unlike suppliers who do random testing, we catch and toss all the substandard modules that might sneak through with a less demanding company.

What's the warranty? All Microtech memory is covered by a lifetime warranty and a 30-day money back satisfaction guarantee. If anything ever goes wrong, give us a call right away. If we determine the memory has failed (or even suspect your problems could be memory related), we'll cross-ship new modules for next day delivery.No hassles.

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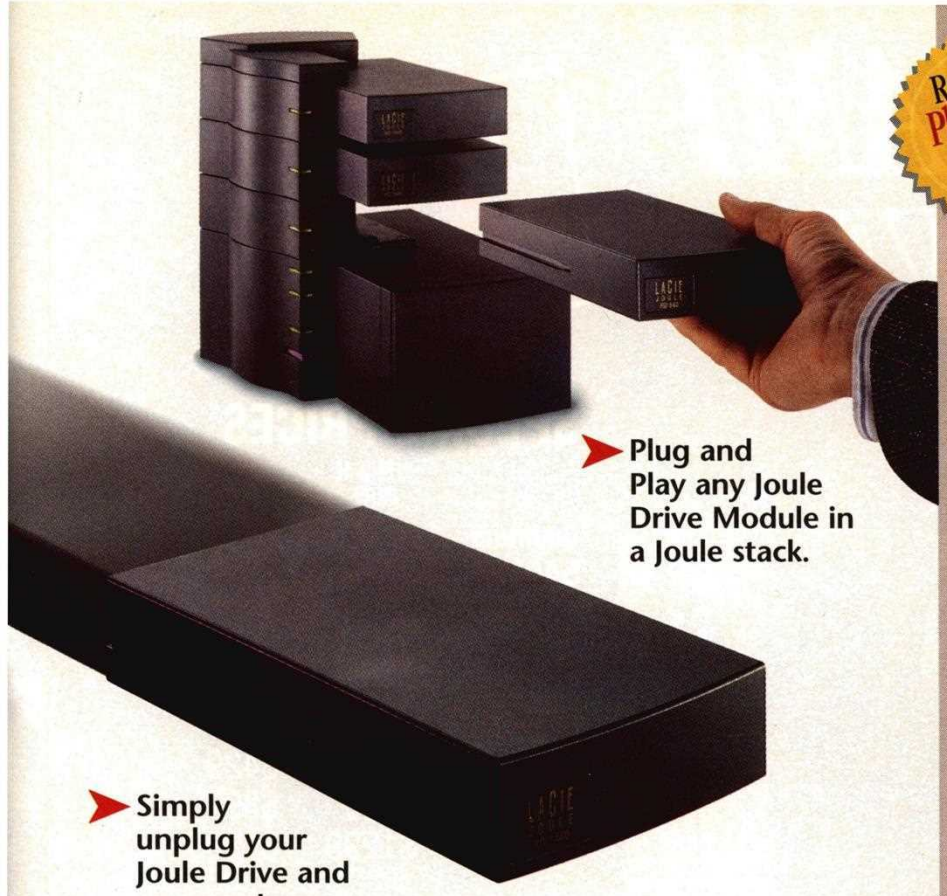

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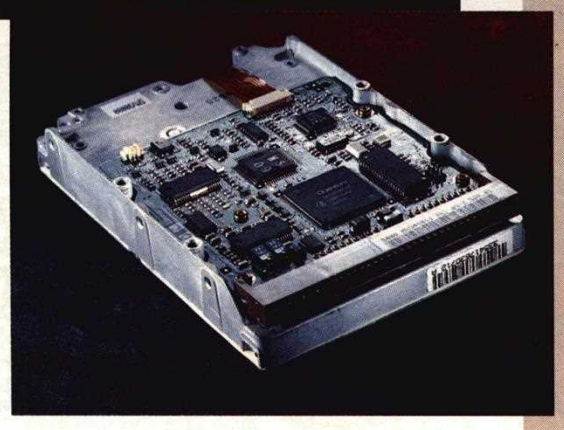

No matter what La Cie drive you choose, we give you more reasons to feel confident in your purchase.

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MacWeek – 10/94

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MAC HOME JOURNAL

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	INTERNAL†	PORTABLE w/ DOCK
3.5" Hard Drives		
Quantum – 2 or 5 year warranties		
540MB	$199	$299*
730MB	$229	$329*
1080MB	$329	$429*
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$429 Joule 1080MB Hard Drive

* These drives are also available in Joule Base configurations for an additional $60.

† Brackets available for $10 with HD purchase

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Simple. Rugged. Award-winning design. The Tsunami has been an industry favorite for years.

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STRATA 3-D UPDATE

An update to StudioPro 1.5.2 that offers improvements such as speed of screen redraw is now available on-line.

AppleShare 4.1 and WS 9150: A fast duo

By Henry Bortman

New version is speedier on Power Macs, but server software is still not native.

Apple's first generation of PowerPC-based Workgroup Servers, which shipped in April 1994 with AppleShare 4.0.2, weren't exactly inspiring performers. The company's new crop of server hardware and software, however, will make you sit up and take notice. For one thing, Apple has bumped up clock speeds on its new servers without pumping up the prices. The former Workgroup Server 6150/60 is now 66-MHz and priced at $3,159 for a 16/700/4x CD configuration with AppleShare; the 8150 has increased from 80 to 110 MHz and remains at $5,809 for a 16/1 Gbyte/4x CD with AppleShare configuration; and the 9150, also formerly at 80 MHz, is now the fastest 601-based Mac around, at 120 MHz. The $8,709 top-of-the-line unit includes 16 Mbytes of RAM, two 1-Gbyte hard drives, a quadruple-speed CD-ROM, a DAT drive (for backups) and AppleShare.

The AppleShare configurations include Version 4.1 of the file-server software and Version 3.6 of the workstation, or client, software. Together the new server and client provide a significant speed boost, particularly on large file transfers.

AppleShare is still not Power Mac-native, however. Although Version 4.1 will run only on PowerPC-based Workgroup Servers — you can't even install it on any of the older 680x0-based servers — it is still every bit as emulated as before.

Apple has also expanded the bundle of software it provides with Workgroup Servers. The list now includes utilities and end-user applications for RAID, backup, shared calendars and contact databases, server management, and automated software distribution. In addition, Apple is now providing a full AppleTalk client for Windows users that enables them to access AppleShare — and other AFP (AppleTalk Filing Protocol) — file servers, as well as printers on AppleTalk networks (see story, Page 44.)

score card

WS 9150/120 with AppleShare 4.1

Apple
List price: $8,709*
Overall value ◆◆◆◆

Apple's Workgroup Server 9150/120 with AppleShare 4.1 delivers significantly better performance than its predecessor, the 9150/80, at no increase in price. AppleShare still isn't Power Mac-native, but thanks to some intelligent caching schemes, it offers much better performance. We were disappointed, though, that the new version won't even install on 680x0-based servers. AppleShare continues to be the easiest-to-maintain file server available to Mac users. In addition, the new Workgroup Server bundles a good deal of useful management and productivity applications. For those on a limited budget, the 6150/66 offers an economical alternative.

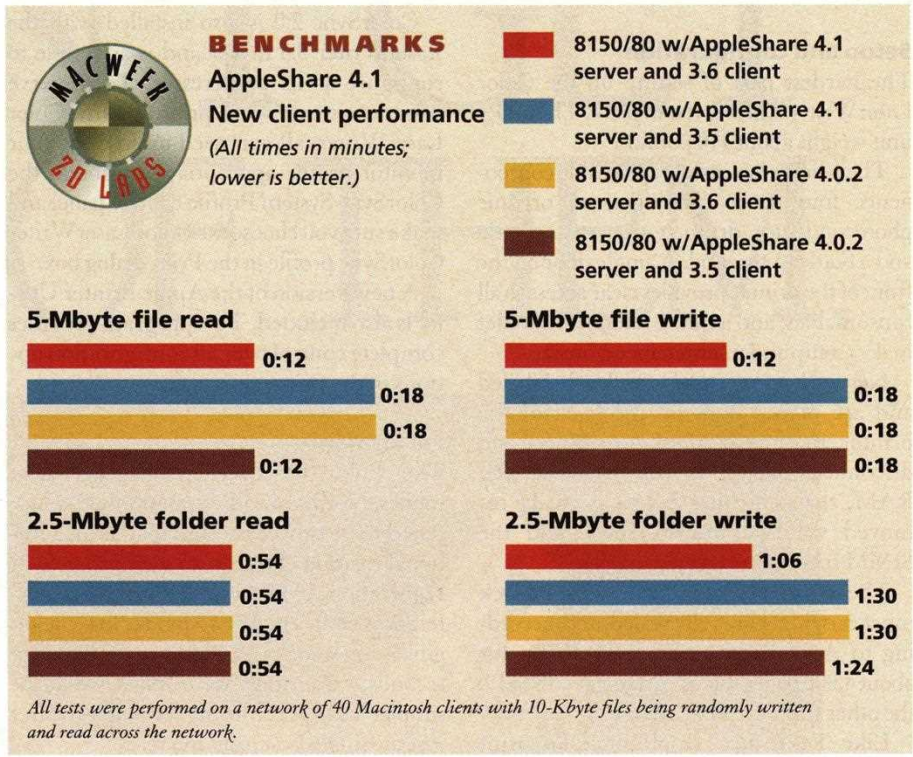
Performance ◆◆◆◆
Features ◆◆◆◆
Ease of use ◆◆◆◆
Documentation/support ◆◆◆◆

**$2,719 for 9150/120 logic-board upgrade; $3,159 for 6150/66 16/700/4x CD with AppleShare.*

Key ◆◆◆◆◆ *Excellent* ◆◆◆◆ *Very good* ◆◆◆ *Good* ◆◆ *Fair* ◆ *Unsatisfactory*

Road test

Apple is touting primarily the performance improvements for these new servers, so we brought them into our 40-node test network at MacWEEK Labs to put them through their paces. We used our standard AppleScript-based NetSurf tool, in which load clients (starting at zero clients and increasing to 40) transferred 10-Kbyte files to and from the server being tested. The load clients were a mix of IIci, Quadra 700 and 950, and Power Mac 7100/66 machines. While these load clients were keeping the server busy, a Quadra 700 test client copied a single 5-Mbyte file, and then a 2.5-Mbyte folder containing 256 10-Kbyte files, to and from the server. We timed these file and folder copies to generate our performance benchmarks (see Page 45).



All tests were performed on a network of 40 Macintosh clients with 10-Kbyte files being randomly written and read across the network.

To see how well Apple's new high-end Workgroup Server fared, we tested a 9150/120 with AppleShare 4.1. A Workgroup Server 8150/80 with AppleShare 4.0.2, the previous top performer, was our baseline. We found the 9150/120 to be an average of twice as fast, though we saw more improvement on large file transfers than with small files. In fact, the average speed gain on 5-Mbyte file reads was just over 200 percent. The heavier the load we put on the new server, the better it did in comparison to the older one.

We also tested the 6150/66 with AppleShare 4.1, which was on average more than 35 percent faster than the 8150/80 running AppleShare 4.0.2.

When we upgraded the 8150/80 to

See AppleShare, Page 44

LaserWriter's color debut

From Page 1

Level 2 controller comes standard with 12 Mbytes of RAM (expandable to 40 Mbytes with standard 72-pin SIMMs) and is powered by a 25-MHz AMD 29030 processor.

The printer has space inside for a hard drive, along with an external SCSI port, and ships complete with LocalTalk, EtherTalk, Novell NetWare, TCP/IP and high-speed bidirectional parallel support in the base unit. As a result, it can quickly and easily plug into almost any Mac, Windows, NetWare or Unix network. The Phaser 540 includes only parallel and SCSI ports in its base model.

The Color LaserWriter comes with a 250-sheet letter-size paper cassette and a 50-sheet multipurpose paper tray; an additional 250-sheet paper feeder costs $619. It prints on legal-size or B4 paper, which gives it an edge over the Phaser 540 in flexibility.

Adding Apple value

Apple's engineers worked hard to enhance the print engine with custom firmware and a number of coprocessor application-specific integrated circuits (ASICs) that improve the engine's print capabilities. The biggest feature is Color PhotoGrade, an extension of the gray-scale image-enhancement technology Apple introduced in the LaserWriter IIg in 1991. Color PhotoGrade is essentially a proprietary halftoning method designed to provide near-photographic quality when printing graphic images. Apple says that the Color LaserWriter can produce the equivalent of a 200-line screen, and our results generally bore this out.

Color PhotoGrade works in conjunction with the proprietary Apple Contone Compression Technology, which allows the Color LaserWriter to print a full-color page in near-photographic quality with only 12 Mbytes of RAM. The Phaser 540, by contrast, comes standard with 20 Mbytes of RAM and requires 36 Mbytes of RAM to print continuous-tone images at 600 dpi.

The Color LaserWriter is also the first Apple device to incorporate ColorSync 2.0,

See LaserWriter, next page

LaserWriter

From previous page

Apple's color-matching technology. The Color-Matching Accelerator ASIC on the Color LaserWriter's controller board provides color-matching capabilities without burdening the main processor, reducing the print time while providing consistent color.

Setup and configuration

The hardest part of setting up the Color LaserWriter is lifting it into place. The bulky unit weighs about 110 pounds.

The printer has seven replaceable components: four toner cartridges, an organic photoconductor drum, toner waste bottle and a bottle of fuser oil. A single door on the front of the printer provides clear access to all consumables, and a quick reference booklet makes setup and maintenance a breeze.

Network connections are clearly labeled and are placed high on the back of the printer, making it simple to connect and disconnect cables. If you want to add RAM, the controller board is easily removed via two thumbscrews, and the SIMM sockets are clearly marked.

The cyan, magenta, yellow and black toner cartridges are fully sealed, and, according to Apple, each cartridge will last for about 4,000 pages. Black cartridges cost $119; the other three are $139 each.

Like Tektronix, Apple includes print drivers and configuration software for Mac, Windows, NetWare and Unix environments with the Color LaserWriter. The manuals that ship with the printer are well-written and clearly delineated for the various platforms.

For Mac users, the LaserWriter 8.3 driver that ships with the Color LaserWriter incorporates the desktop printing functionality found in Apple's QuickDraw GX without forcing the installation of GX (see MacWEEK, June 12, Page 38.) With this driver installed, you can place icons on your desktop for the various printers on a network and then print to them at will via drag-and-drop without having to go through the Chooser.

ColorSync 2.0 is also installed with the LaserWriter 8.3 driver and is as simple to configure as its predecessor. To preserve color consistency when printing to the Color LaserWriter, all you need to do is set your monitor profile appropriately through the ColorSync System Profile control panel and make sure you choose the Color LaserWriter ColorSync profile in the Print dialog box.

A new version of the Apple Printer Utility is also included. This program provides complete control over all configuration options in the printer.

Performance

The Color LaserWriter has two print modes, Normal and Best. Best mode is supposed to be slower because it adds an additional rotation of the drum to improve color registration. However, we found time differences between the two modes to be negligible — in some cases it was a matter of a few seconds. Given this, we think it would be simpler and less confusing for Apple to offer just the single Best print mode.

In our testing, the Color LaserWriter proved slower than the 36-Mbyte-equipped Phaser 540 in most tests (see benchmarks below). Our 12-Mbyte Color LaserWriter was only one-third as fast on a complex Adobe Illustrator document but nearly equaled the 540 with an Adobe Photoshop image. The exception was the 25-page monochrome Microsoft Word file, which the Color LaserWriter screamed through in a little over three minutes, less than half the time the 14-ppm Phaser 540 needed.

ED CALDWELL

Apple's Color LaserWriter 12/600 PS, with built-in Color PhotoGrade and ColorSync 2.0, is a well-designed unit that sets new standards for ease of use, maintenance and color fidelity.

When we added an additional 16 Mbytes of RAM to the printer, we saw an improvement in the print times for some file types, notably the two-page Word color test and the Microsoft PowerPoint presentation.

When we reviewed the Phaser 540, we said it produced the most consistent color of any color laser we had tested. The Color LaserWriter outdoes the Phaser slightly, largely because of the presence of ColorSync 2.0 and Color PhotoGrade. Comparing a range of print samples from multiple applications, the consistency and the quality of the output from the Color LaserWriter was crisper and cleaner.

The Color LaserWriter's type quality is excellent, on par with the best 600-dpi Canon monochrome laser engines, and is slightly crisper than the type quality of the Phaser 540 (which is still very good).

The only problem we ran into with the Color LaserWriter was when we tried to print images that had a higher resolution (in this case, 1,200 dpi) than the printer could handle. Unlike other printers we've tested, which simply throw away the unused data, the Color LaserWriter would occasionally display artifacts in certain areas of the image. This won't be a problem for users accustomed to scanning in 300-dpi images on a flatbed scanner, but graphics-oriented users who want to print scanned photographs will have to make sure they adjust the resolution of their images accordingly when they print on the Color LaserWriter.

The printer is not intended to replace a dye-sublimation or other specialty printer for photographic-quality output. For most business users the output will be more than satisfactory, and it can be ideal for graphics professionals and others who want versatility over the best possible image quality.

Conclusions

Most successful printer vendors have realized that the standard office environment demands simplicity, high performance, minimal maintenance requirements and top image quality in a printer. The Color LaserWriter provides ample proof that when it comes to printing, Apple understands these needs and expectations.

Waiting out the first round of the color laser wars has served Apple well, especially when comparing the Color LaserWriter with less-than-perfect implementations such as Hewlett-Packard Co.'s Color LaserJet and QMS Inc.'s magicolor LX (see MacWEEK, Sept. 19, 1994, Page 29).

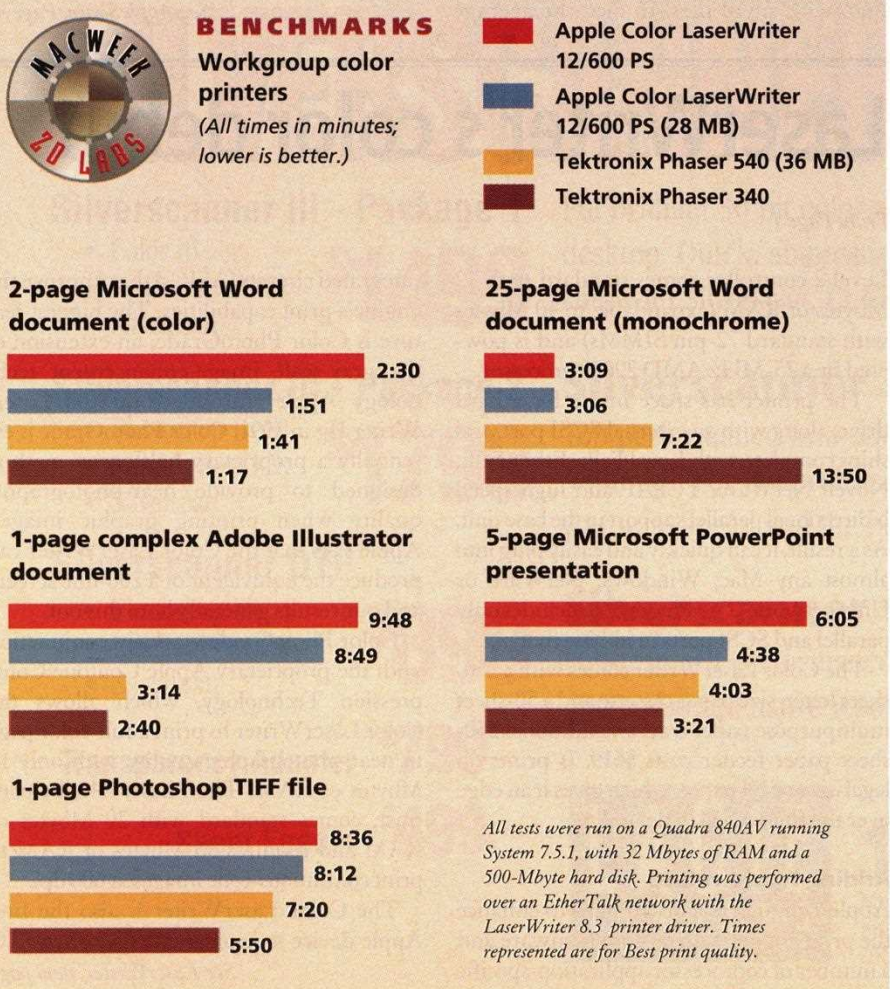
The Color LaserWriter has risen far above the offerings from HP, QMS and Xerox Corp., and is a viable and attractively priced option to Tektronix's Phaser 540. With two strong companies providing such complete and well-thought-out solutions, the color laser market is poised to explode.

Apple is at (408) 996-1010 or (800) 462-7753; http://www.info.apple.com. □

BENCHMARKS

Workgroup color printers

(All times in minutes; lower is better.)



All tests were run on a Quadra 840AV running System 7.5.1, with 32 Mbytes of RAM and a 500-Mbyte hard disk. Printing was performed over an EtherTalk network with the LaserWriter 8.3 printer driver. Times represented are for Best print quality.

score card

Color LaserWriter 12/600 PS

Apple

Overall value ♦♦♦♦ **List price: $6,989**

Apple's entry into the color laser printer market, the Color LaserWriter 12/600 PS, is a beauty. The printer was created in conjunction with longtime laser partner Canon Inc. The result is a very good-performing box — 3 pages per minute for color, 12 ppm for monochrome — that provides top-notch, consistent color via ColorSync 2.0 and Color PhotoGrade, both of which are built into the printer. Like its primary competitor, Tektronix Inc.'s Phaser 540, which beat the Apple offering in color print times, the Color LaserWriter is a solid effort that is extremely well-designed. It should be attractive to business workgroups and graphic artists who want simplicity and ease of use as much as they want clean color or monochrome output. In this quickly changing market, the Color LaserWriter's full-featured package edges out all in its class.

Performance ♦♦♦♦
Features ♦♦♦♦♦
Configuration ♦♦♦♦♦
Compatibility ♦♦♦♦♦
Documentation/support ♦♦♦♦♦

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AppleShare

From Page 41

AppleShare 4.1 (with clients upgraded to 3.6), we saw an overall performance gain of 54 percent. Again, we saw the greatest gain reading a single 5-Mbyte file from the server, a 120 percent improvement. Writing the same 5-Mbyte file to the server was 62 percent faster. Reading a 2.5-Mbyte folder of small files, however, picked up only an average of 4 percent. Considering that registered owners can get the AppleShare 4.1 upgrade from Apple for the cost of shipping the disks, if you are the current owner of a PowerPC-based Workgroup Server, we highly recommend that you upgrade to AppleShare 4.1 and the 3.6 client.

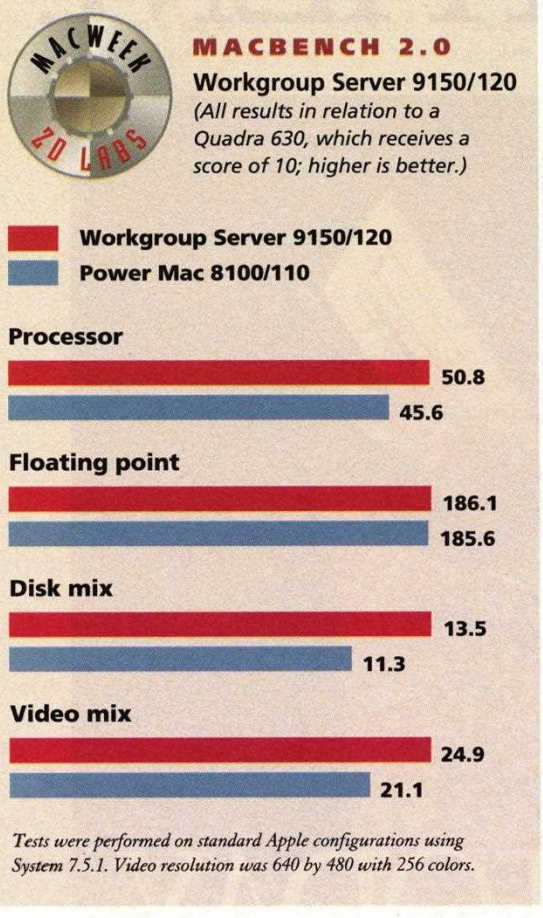
Under the hood

Clearly, Apple has made some significant improvements to its file server product line. Just how did it pull it off? One obvious source is the processor speed of the new servers; all of them have been bumped up to some degree. At the high end, the 9150 has received a 50 percent clock-speed boost, from 80 MHz to 120 MHz, and now includes a 1-Mbyte Level 2 cache standard.

Apple has also made significant changes to both the server and the client software. On the server software side, the major improvement is larger caches. This means that when users request data from the server, it will more often have that data already stored in fast-access memory, rather than having to be fetched from the relatively slower disk drive. On the client side, AppleShare Workstation 3.6 takes advantage of Finder 7.5.1's ability to read and write files in much larger blocks of data than before. (The previous Finder was limited to 4.5-Kbyte blocks; it can now handle up to 128-Kbyte blocks.) Larger blocks reduce file transfer overhead significantly. This is why the new software shows such a significant speed gain on large file transfers.

Both the new server and client require System 7.5.1, which is preinstalled on servers configured with AppleShare 4.1. To take full advantage of the new server, users will have to upgrade their Macs to 7.5.1 as well. Workgroup Servers that ship in AppleShare configura-

See AppleShare, next page



Tests were performed on standard Apple configurations using System 7.5.1. Video resolution was 640 by 480 with 256 colors.

IN BRIEF

SmartSketch 1.0

Easy-to-use draw app puts complexity behind the scenes

Overall value ♦♦♦♦

FutureWave Software Inc. has released an inexpensive, low-end draw program that ushers in some major new ideas about drawing on the computer. SmartSketch is aimed at novices who need to create illustrations and pictures for the screen or printing. Though simple in its goals, the $69.95 application contains some features and tools that will be the envy of high-end users.

SmartSketch requires 4 Mbytes of disk space and at least 4 (preferably 8) Mbytes of RAM. The program works fine on 68030 Macintoshes, but we recommend 68040 or PowerPC machines. Unfortunately, this initial release is not Power Mac-native.

Drawing on paint

Even experienced graphics users will be a little confused when they first see SmartSketch — it's difficult to tell whether it's a raster-based paint program or a vector-based draw program. The Tool palette includes the standard painting tools, but in use they seem to exhibit the characteristics of a draw program.

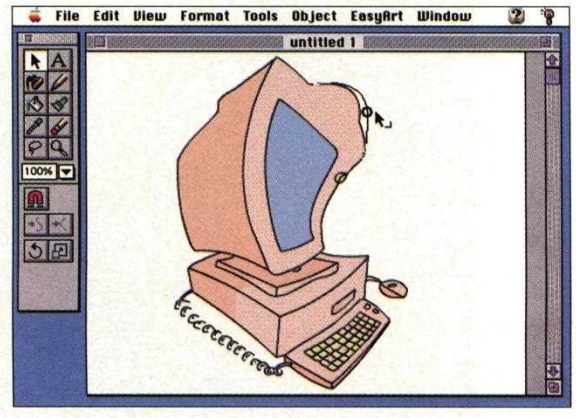
The truth is that SmartSketch is a vector-based program, but because it does enough work on its own, it can adjust its shapes on the fly to feel like a paint program. Rather than using a traditional draw-program approach, SmartSketch is based on a new technology that lets the program hide much of the complexity of working with curves and objects.

For example, in vector-based programs such as Adobe Illustrator, you reshape curves by using control points and Bezier handles. To reshape a curve in SmartSketch you simply grab part of the curve and drag it to a new location, rather like reshaping a piece of string laid out on a flat surface. SmartSketch transparently manages curve segments.

Be objective

Like Illustrator's Paint Bucket tool, painting with SmartSketch's Brush tool creates objects in the shape of your painted strokes. So, if you paint a stroke, SmartSketch automatically creates an outline of that painted shape. Unlike Illustrator, however, if you then go back and paint more strokes, or use the Eraser to delete part of a stroke, SmartSketch will automatically change the outline to describe the new strokes. Similarly, the Lasso selection tool can be used just like its paint pro-

See SmartSketch, next page



You don't have to work with control points or handles when you reshape a curve in FutureWave's SmartSketch. Instead, you can grab any part of the curve to manipulate it. SmartSketch creates and manages any control points.

New Workgroup Servers include impressive bundles

Now that Apple has undergone its obligatory annual company reorganization for 1995, the buzzword in Cupertino is "solutions." Accordingly, the new Workgroup Servers come bundled with a wider array of software packages that will come in handy for a network manager in distress. (Software licenses are unlimited unless otherwise indicated.)

- Apple RAID 1.0.2. Apple's homegrown RAID formatting software allows you to use a pair of disk drives either for disk mirroring (to provide secure data backup) or for disk striping (to improve disk throughput and, thereby, server performance).
- Restrospect Remote 2.1 from Dantz Development Corp. If you purchase a Workgroup Server configuration that includes a DAT drive, Apple provides this top-rated backup software capable of automatically backing up data on both servers and Mac clients. Windows clients are not currently supported. The license is for one server and three clients.
- Server Manager 3.0.5 from Santorini Consulting and Design Inc. This management utility, bundled with configurations that include AppleShare, lets you monitor and administer AppleShare servers remotely from any Mac on the network.
- FileWave 2.1.3 from Wave Research Inc. FileWave provides an automated, centralized way for a network administrator to distribute new or updated software to multiple users over the network.

Also included with the new servers are several end-user applications:

- Adobe Acrobat Reader 2.0.1 from Adobe Systems Inc. Apple has signed on to Adobe's Portable Document Format as a way of disseminating graphically rich documents to users on Mac OS, DOS, Windows and Unix platforms. Acrobat Reader 2, which Adobe distributes free, allows users to read and navigate through these documents.
- Now Contact 3.0 and Now Up-to-Date 3.0 from Now Software Inc. Now's popular contact and calendar programs let users store and share contact information, events and to-dos. Now Up-to-Date's calendaring function can be used by a workgroup to negotiate meeting times. Contact and Up-to-Date are well-integrated with each other, making it easy to attach Now Contact information to Now Up-to-Date calendar events and vice versa. Apple provides 10-user licenses for these applications.
- Viper Instant-Access 1.3 from IT Design USA. This small database application is designed for quick access to important information, such as company phone lists, price lists and customer contact information. Apple provides a 10-user license.
- AppleShare Client for Windows. The lack of this client software has been a thorn in Apple's side for years, limiting acceptance of AppleShare within many office environments. Co-developed with Miramar Inc., the Windows client bundled with new AppleShare servers enables Windows users to access AppleShare and other AFP (AppleTalk Filing Protocol) file servers, as well as AppleTalk-connected printers. It does not implement file sharing on Windows machines; that capability is available with Miramar's MacLan Connect. For those with older AppleShare 3.x or 4.x servers who want to support Windows users, a license to distribute the Windows client is available as a separate product from Apple for $199.

All told, this software bundle is the most aggressive Apple has ever offered with its servers. It makes a strong contribution to the overall value of Workgroup Servers. — By Henry Bortman

Because SmartSketch automatically reshapes curves of different colors, Boolean operations are possible using any painting tool. Different colors will divide shapes, while shapes of similar colors will be joined together.

SmartSketch

From previous page

gram counterpart to select specific portions of an object.

SmartSketch's technology goes further in that it understands many "painterly" operations as if they were object-based tasks. For example, if you take the Pencil tool and draw four straight lines in the shape of a square, SmartSketch understands that this is one object to be treated like a square. However, it also understands that the components are still straight lines that can be altered and edited just like any other line.

Unlike a traditional draw program, if lines are touching in SmartSketch, you can assume they are one object. Further, if any space is enclosed by lines, it can be filled with color. Consequently, although the program is treating your picture as objects, it's behaving like a paint program.

Power tools

Each SmartSketch tool has several modifiers that are controlled through pop-up menus at the bottom of the Tool palette. For example, the Pencil tool has modifiers for changing ink color and line width, as well as style and smoothing options. The smoothing options can automatically smooth or straighten hand-drawn lines. These options can also be performed on existing lines and shapes.

The Brush tool has a unique set of modifiers that allow you to control whether you're painting normally, painting inside or behind a selected object, or just painting an object's fill colors.

Although it supports pressure-sensitive tablets, SmartSketch's tools are not tablet-aware. We'd like to see pressure-sensitive brushes rather than having to use SmartSketch's predefined brush shapes. Also, there are no graphic primitives, such as squares or circles; FutureWave expects you to use the program's straightening and smoothing controls to create these shapes. While these controls work fine, they require more keystrokes than just simply clicking the Rectangle or Ellipse tool in Illustrator.

Many amenities

SmartSketch offers many expected draw-program features, such as grids and snaps, flipping, rotating, and scaling. But the nicest amenity, and one we'd like to see in high-end paint programs, is SmartSketch's anti-aliased mode, where all shapes on screen are automatically smoothed. Even as you're reshaping a line, the program displays smooth, anti-aliased objects free of jagged edges.

The clunkiest part of SmartSketch's interface, the grouping interface, involves one of its most powerful features. If two strokes of the same color are painted on top of each other, SmartSketch automatically merges those strokes into one shape. However, if you paint a red stroke on top of a blue stroke, the intersecting part of the blue stroke is automatically knocked out.

By using two commands, Group and Break Apart, you can control how objects interact with each other when overlapping. Unfortunately, the interface for these commands is very confusing and non-intuitive. We'd like to see FutureWave rethink this aspect of its interface.

Documentation and support

SmartSketch ships with a very good manual and extensive on-screen documentation — proof that FutureWave understands the needs of its audience very well.

A series of built-in lessons (included as multipage SmartSketch documents) offers instruction on all aspects of the program. This easy-to-follow tutorial provides enough information that you may not need the manual. Also included is a floating palette of more than 500 clip-art images that can be easily dragged and dropped into any image. They provide an excellent starting place for novice sketchers.

FutureWave offers free technical support via a toll call.

Conclusions

FutureWave is definitely onto something. It has successfully introduced a new approach to computer-based illustration and packaged it in an affordable, friendly, easy-to-use program. SmartSketch is ideal for beginning users: Although parts of the interface can be a little confusing, this is still by far the easiest drawing program yet.

We hope FutureWave continues to build on this solid foundation by adding more paint tools and a native-mode upgrade. SmartSketch's capabilities are strong enough that there's no reason it couldn't, with more features, compete against higher-end products. More-advanced users should keep on eye on this program.

FutureWave Software Inc. of San Diego can be reached at (619) 637-6190 or (800) 619-6193; fax (619) 637-9032; futurewav@aol.com. — *By Ben Long*

AppleShare

From previous page

tions include Workstation 3.6 updater software, which includes the System Update 1.0 for upgrading a 7.5 system to 7.5.1. If you're not already running 7.5 on your Mac, you won't be able to upgrade your AppleShare client software to 3.6.

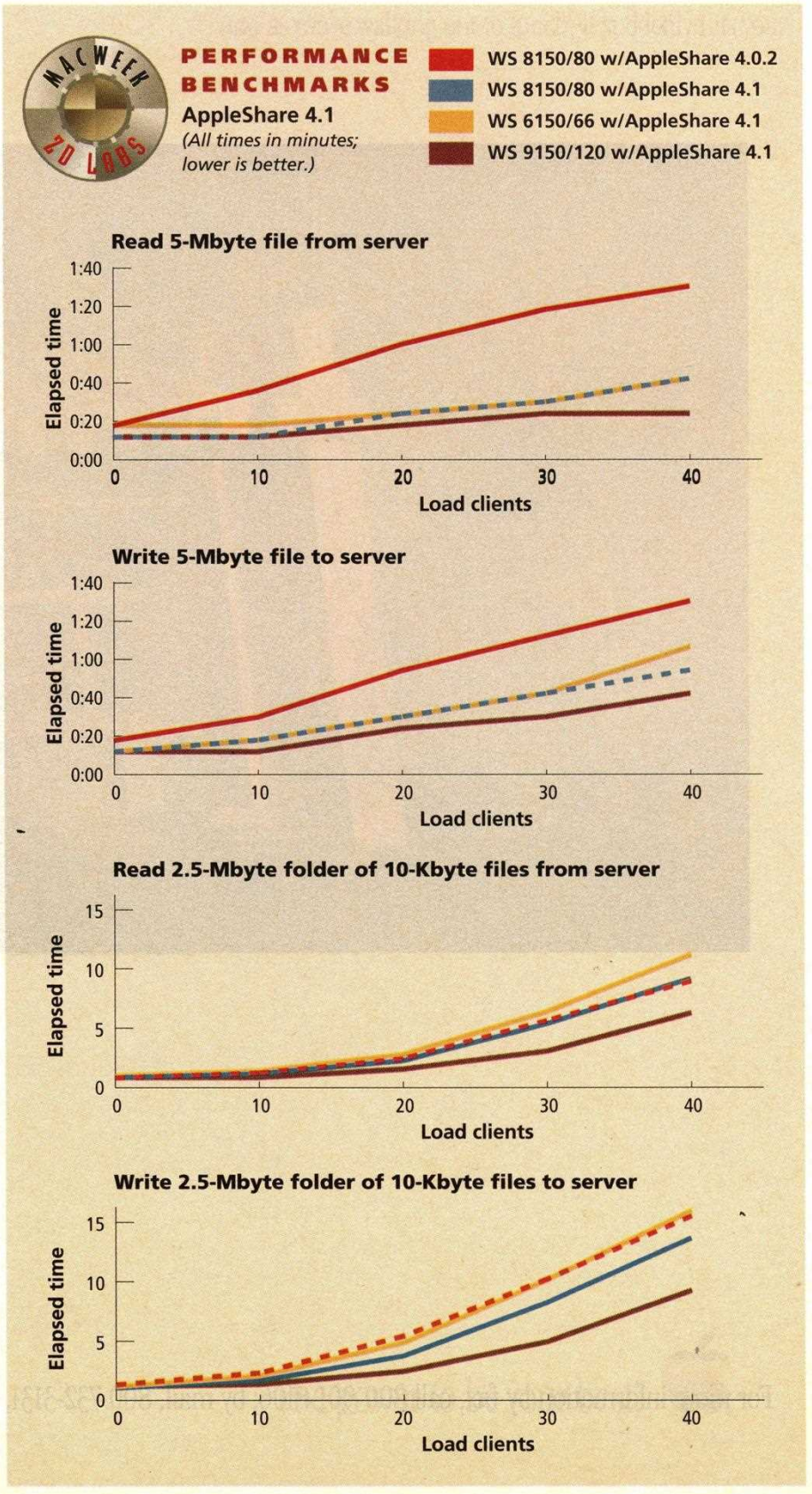
Make sure you upgrade the Macs on your network to the 3.6 client if you install the 4.1 server. We found that much of the benefit of 4.1 can be realized only in conjunction with the new client software (see benchmarks, Page 41). Conversely, installing the new client is of no value without the new server.

The documentation for the server and AppleShare is standard Apple fare, which is to say good; but Apple ups the ante on support by offering Workgroup Server customers a dedicated technical support line for 24-hour-a-day, 365-day-a-year support.

Conclusions

Although AppleShare has rarely won kudos for its speed, it has long been the file server of choice for Mac users who want reasonable performance at a reasonable price, with minimal administrative hassle. Apple's new Workgroup Server 9150/120 with AppleShare 4.1 continues that tradition and delivers a significant speed boost as well. Add to that the greatly expanded bundle of management and productivity software Apple now includes with its new servers, and you have the best AppleShare-server value the company has ever offered.

Apple is at (408) 862-3385; fax-back (800) 462-7753; http://www.info.apple.com. □



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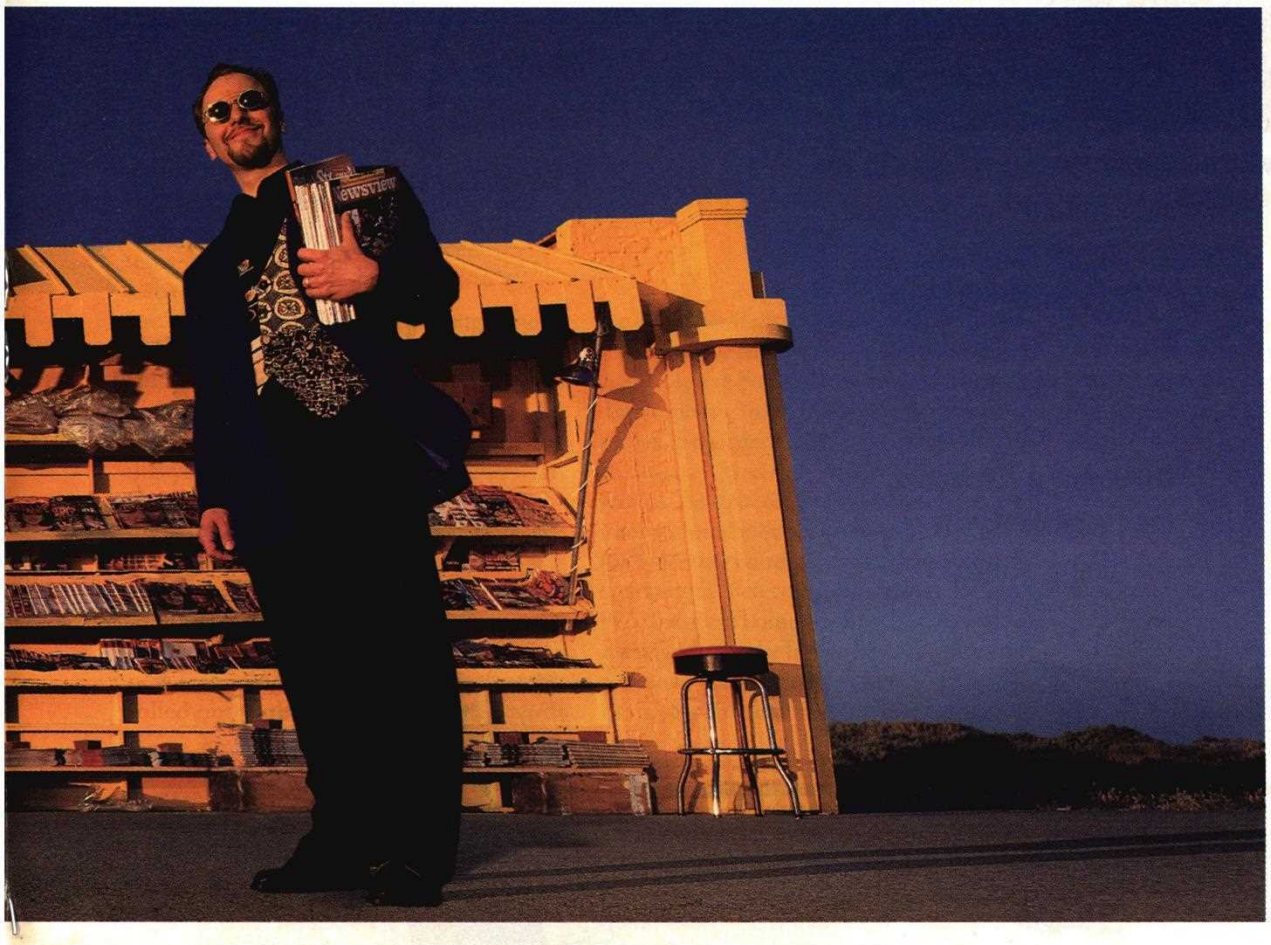

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Apple

Mac OS For Windows

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MULTIMEDIA

The next best thing to being right there

By Connie Guglielmo

Conducting a conference by video offers collaboration as well as sight and sound.

After years of hype and promise, desktop videoconferencing — the technology that lets you use your personal computer to collaborate with an individual or groups at remote sites using voice, video, text and graphics — has finally arrived on the Macintosh. Developers including RSI Systems Inc., Compression Labs Inc., Creative Labs Inc. and Avistar Systems, among others, have solutions that let Mac users traverse ISDN and telephone lines and LANs as well as WANs to make eye contact.

More important, the introduction earlier this year of Apple's new QuickTime Conferencing (QTC) technology, a System 7.5 software extension, gives developers the groundwork for building plug-and-play videoconferencing systems for the Mac.

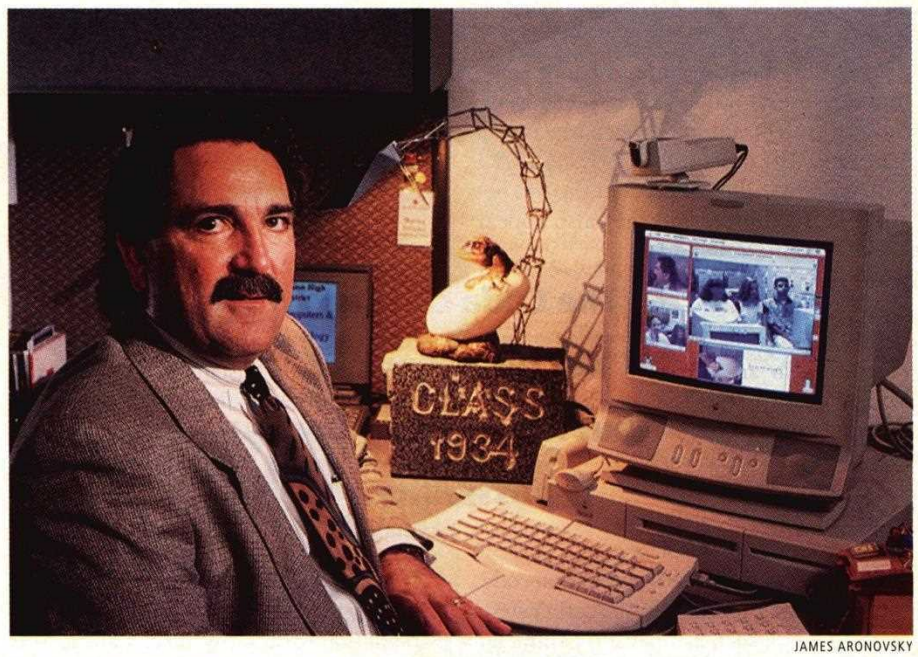
While it has been slow in penetrating the corporate arena, videoconferencing is not a new technology. The stand-alone systems rolled out in the early 1980s were proprietary and costly, requiring specialized network links. Companies such as PictureTel Corp. and VTEL Corp. introduced systems that were lower-cost (tens of thousands of dollars instead of hundreds of thousands) but still proprietary.

That picture has changed. Although bandwidth remains an issue, videoconferencing systems are available that run over a variety of networks, including ISDN, or Integrated Services Digital Network, lines, switched-56 digital phone lines, telephone lines, the Internet, Ethernet-based LANs, and Asynchronous Transfer Mode (ATM) networks. And, because of the emergence of international videoconferencing standards for video and audio, most notably the International Telecommunications Union's H.320 suite of compression-decompression specifications, the lines of communications are now open among systems. The ITU has also defined a standard resolution for videoconferencing: the Common Intermediate Format resolution, which is 352 by 288 pixels.

Desktop videoconferencing solutions, in which video- and audio-enhanced personal computers (such as the Mac AV series) play a central role, have reduced the cost of systems to less than $10,000 (not including the Mac). Frost & Sullivan, a Mountain View, Calif.-based market research firm, predicts that videoconferencing systems based on personal computers will have the fastest revenue growth rate.

Unlike stand-alone or room-based videoconferencing systems, which emphasize high-quality video and audio transmissions, desktop solutions offer variable video frame rates ranging from a clunky 5 frames per second to 30 fps (real time), depending on window size and the network connection.

But desktop conferencing systems bring an important component to the virtual meeting process: the desktop. Remote Mac users can share the desktop and collaborate on computer-generated documents.



JAMES ARONOVSKY

Warren Williams, a QTC beta tester and director of computer and technology services for the Grossmont Union High School District, said videoconferencing will change classroom instruction.

Get the picture

Among the desktop systems available today are RSI's Eris Personal Video Communication System and Compression Labs' Cameo Personal Video System, which are point-to-point systems, and Avistar's multipoint Avistar Collaboration System.

RSI's Eris is a stand-alone peripheral that is H.320-compliant and offers whiteboard sharing and video, audio and file transfer capabilities; it includes phonebook software that lets users dial by clicking on a name or photograph. The box includes a card for setting up connections via ISDN lines as well as telephone lines.

Compression Labs' Cameo, designed to run on a System 7-equipped Mac with a built-in video digitizer, supports video displays up to 15 fps at a resolution of 128 by 112 pixels. It can operate over ISDN, switched-56 and Ethernet networks.

Avistar is an H.320-compliant system that runs at video rates up to 30 fps on Macs, Windows PCs and Sun workstations and includes a Sun-based server with whiteboarding software called Shareboard.

QTC connection

Perhaps the biggest impact on the Mac videoconferencing market is yet to come. That's because Apple took a stand on desktop videoconferencing with its plans to sell QTC applications in three configurations, designed for 68040 and PowerPC Macs with at least 16 Mbytes of RAM. The Apple Media Conference Kit includes the QTC system extension, the Apple Media Conference application and a digital video camera. The Conference Kit Pro adds an H.320 compression-decompression and ISDN card that is being developed for Apple by Société Anonyme de Télécommunications (a division of SAGEM). Users can also choose the Complete Media Conference System, which includes all of the above plus a Power Mac 7100AV, 17-inch color monitor, external speakers and a keyboard.

Due this summer, the QTC applications support point-to-point, multipoint and broadcast connections over a variety of network connections, including Ethernet-based LANs and ISDN, Internet and ATM WANs.

Users acknowledged the importance of making desktop videoconferencing and collaboration an integral part of the Mac system. "It's going to change the way we deliver classroom instruction," said QTC beta tester Warren Williams, director of computer and

See Solutions, next page

Reach out and see someone

As the crow flies, Mercy Hospital in St. Joseph, Mich., is about 80 miles from the University of Chicago. But what normally would be about an hour commute stretches to four hours because of a major obstacle separating the medical centers: Lake Michigan.

Until now, making that commute was the only way that Dr. Joseph Foss, assistant professor in the Department of Anesthesiology at the University of Chicago, could meet with the staff at Mercy Hospital.

But Foss' commuting days are over, thanks to an old Mac II, a 27-inch television monitor, a video camera, an ISDN line and Eris, a $4,495 personal computer-based videoconferencing system from RSI Systems Inc. The anesthesiology staff in Chicago now has virtual meetings with Mercy staff members, who have built their Eris videoconferencing system around an old Mac SE/30.

Foss described the video, which runs at 15 frames per second, as "herky-jerky"; however, he said he's impressed with the desktop videoconferencing technology that has allowed him to be part of educational and administrative meetings, broadcast videotaped events, share information, and collaborate on documents with colleagues in St. Joseph without having to leave the building.

Although the system has been up and running only since April, Foss said that his department considers it a worthwhile investment. "We're already talking about branching out to other hospitals and have two sites interested in hooking up with us."

— By Connie Guglielmo

MACINTOUCH RIC FORD

Hardware problems not the Type 11 prime suspect

Type 11 crashes continue to haunt some unlucky users. The crashes seem to be most prevalent among Power Macintosh 7100 and 8100 users running System 7.5.1 with graphics applications, but they do not affect all such users and they also appear with System 7.5 and with other applications.

Apple suggests several steps for resolving Type 11 crashes in an article from the Tech Info Library, "Power Macintosh: Meaning of Error Type 11." The article notes that the error can be caused by corruption of the Power Macs' 68LC040 emulation code. As described in recent columns, other steps may also help, such as resetting parameter RAM, updating disk drivers or removing RAM Doubler. It is important to disable extensions before all installations and when creating floppies from image files.

Consistent Type 11 errors are *not* likely to be caused by bad memory or SCSI disk errors. Memory problems result in random types of crashes at random times. Disk errors may be flagged immediately by the Finder, may quietly corrupt files and directories, or may simply crash the Mac during disk access. These errors are also random, except for being associated with disk operations.

So, frequent Type 11 errors must be caused by a software problem somewhere. It may be an application, a font file, a font database, an Installer bug, an extension, a bug in the Mac OS, a problem with such invisible files as AppleShare PDS and Desktop DF, PRAM, or a bad Preferences file. People have been trying to vanquish the gremlins by re-installing software and eliminating extensions. This sometimes solves the problem, sometimes does not and sometimes solves it for a few days until the crashes return.

The Cuda clue may not be an answer but it's an intriguing possibility.

Tracy Valleau, who got bitten by the Type 11 bug, is also looking for a good explanation for the mystery. Valleau was able to eliminate the crashes not by resetting PRAM but only by unplugging his Mac and removing its battery for 20 minutes. Valleau said he believes that this procedure must be done *after* installing System 7.5 and System 7.5 Update 1.0. The Installer seems to play with PRAM, and it seems to be involved in the problems, although this is unclear.

Another component could theoretically play a role in the mystery, too. Quadra AV and Power Mac models use a custom chip called "Cuda," which, according to Apple's Developer Notes, manages PRAM, power, system resets and the real-time clock. Removing the battery is probably the only way to reset this chip, other than replacing the motherboard, which has fixed the crashes for a few people.

GORDON STUDER

If you encounter Type 11 errors after doing everything by the book, try updating your disk driver, re-installing system software, and then removing the power cord and the motherboard battery for about half an hour. If crashes still occur, it may have something to do with a couple of reported bugs in the Modern Memory Manager, so try disabling that as well, and please let me know what happens.

Installer tricks

A new article in the Tech Info Library ("Easy Install: When This Option Installs Everything") helps explain another Mac mystery: why the Installer never does what you expect. It seems that Easy Install does not always run a script on the install disk. It sometimes takes instructions out of the existing System file: "When an installer builds a System suitcase it places within it a copy of the installer script. Each successive installer uses the script in the System suitcase."

Thus, if you or someone else once built a System file to support all Macs, Easy Install will forever install components for all Macs on this system. Updating a Quadra might also install PowerBook-only and Power Mac files in this scenario.

It would seem smarter for the Installer to ask the user what to do. (After all, the inventors of the Macintosh created dialog boxes for a reason.) The current behavior has confused many people.

CD session search

Searching for "multisession" in the Tech Info Library turns up a variety of notes about compatibility issues with multisession CD-ROMs, including a problem with JVC CD recorders (also sold by Pinnacle Micro Inc.) and Apple CD300 Plus drives. One note says Apple service providers can fix some multisession problems with CD300 drives. Reader Kevin Smyth found a simpler solution to his problems with multisession Photo CDs after an extensive debugging process: disabling Adobe Type Reunion 1.2. □

Comments on MacInTouch are welcome at 7 Parmenter Ave., Maynard, Mass. 01754. Phone (508) 897-2621. Please address e-mail to 72511,44 on CompuServe or ricford@macintouch.com on the Internet. The MacInTouch home page is at http://www.macintouch.com/~ricford/.

SOLUTIONS

From previous page

technology services for the Grossmont Union High School District in San Diego. The district has 16 sites that serve about 20,000 students. "While we are exploring the bandwidth consequences of using [QTC], the technology would enable our educators to collaborate over our WAN," Williams said. He said he expects QTC applications to be up and running in the 1995-1996 school year.

Developers are already taking note of QTC's potential and users' enthusiasm. AT&T Corp. recently announced that it will use QTC technology as part of its WorldWorx Network Services, designed to provide users access to a digital network and point-to-point conferencing services.

Products that will build on QTC include Meet-Me from Société Anonyme de Télécommunications due at the end of this month and the FM-A71 ISDN-based card from Nippon Telegraph and Telephone Corp. FM-A71, which will be part of NTT's Facemate line of videoconferencing and collaboration products, will be available only for the Japanese market this July.

Several software developers have also announced QTC support. Intelligence At Large Inc. has said it will support QTC in its BeingThere product line, starting with BeingThere Sidebar. Bundled with its BeingThere 2.0 conferencing and collaboration software, BeingThere Sidebar is a multimedia utility for creating video mail, multimedia presentations and QuickTime movies. The company said it plans to release BeingThere Sidebar as a stand-alone application for use with QTC technology.

Crosswise Corp., developers of Face to Face document conferencing software, said it will support video and audio conferencing via QTC technology. The QTC version of Face to Face is due to ship when Apple releases its QTC technology.

Expect more videoconferencing product announcements in the months ahead. White Pine Software Inc. of Nashua, N.H., has already said by the end of this year it will release a commercial version of the CU-SeeMe shareware, a videoconferencing application for use over Internet and TCP/IP networks that was developed by Cornell University.

Santa Clara, Calif.-based 3Com Corp. announced last year that it is working on an extension of Ethernet technology called Priority Access Control Enabled, or PACE, which promises to let users run real-time interactive and multimedia applications (such as videoconferencing) over their existing Ethernet networks without having to upgrade the network infrastructure. □

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WorldWorx Network Services: No price yet
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AVISTAR SYSTEMS
Avistar Collaboration System: No price yet
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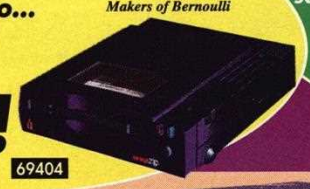

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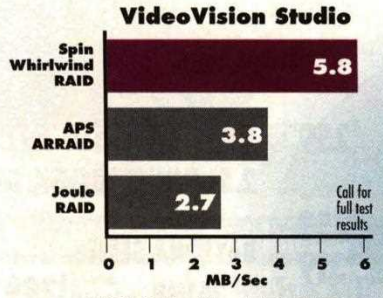

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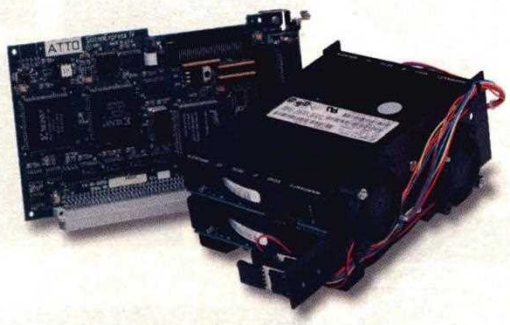

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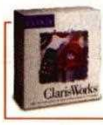

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- 100,000 hours MTBF

NOW SHIPPING WITH ACTIVE TERMINATION

$245 C109 1005

FREE CARTRIDGE

C109 1005	**3.5" ClubMac 105MB** *includes FREE Formatted 105MB Cartridge*	External	**$245**

SyQuest 5 YEAR Warranty* ON CARTRIDGES

GENUINE SYQUEST CARTRIDGES

Part Number	Media	Qty 1	Qty 10	Qty 20
S198 1010	**44MB**	**$43ea**	**$42ea**	**$41ea**
S198 1011	**88MB**	**$48ea**	**$47ea**	**$46ea**
S198 1012	**200MB**	**$76ea**	**$74ea**	**$72ea**
S198 1013	**105MB**	**$55ea**	**$53ea**	**$51ea**
S198 1014	**270MB**	**$62ea**	**$61ea**	**$60ea**

* Warranty after first year, handled by SyQuest.

NEC

NEW PRODUCT

NEC MultiSpin 6Xe $559 N024 1062

6X Speed

- Blazing 900 KB/sec
- 150ms access time
- Removable disc cartridge included
- Two Year Limited Warranty

NEC MultiSpin 2V

$199 N024 1008

2X Speed

- Power Tray
- 320ms access time
- 300KB/sec transfer rate
- Two Year Limited Warranty

N024 1062	**NEC MultiSpin 6Xe**	**$559**
N024 1011	**NEC MultiSpin 3Xp**	**$379**
N024 1008	**NEC MultiSpin 2V Mac**	**$199**

Seagate

Unformatted Capacity	Model	Description	Part No.	Internal	Part No.	External
3.5" Half Height & Low Profile (LP)						
2.4GB	32430N	**Hawk 2 LP**	C109 2211	**$939**	C109 2112	**$999**
4.3GB	15230N	**Hawk 4**	C109 2212	**$1189**	C109 2113	**$1249**
2.5GB	32550N	**Barracuda 2 LP**	C109 2203	**$1089**	C109 2109	**$1149**
4.3GB	15150N	**Barracuda 4**	C109 2207	**$1519**	C109 2106	**$1579**
5.25" Full Height						
9.1GB	410800N	**Elite-9**			C109 2110	**$2799**

4.3GB BARRACUDA 4 $1579

8.5ms average seek time
7,200 RPM rotational speed

Seagate 5 YEAR Warranty

EXTERNAL

NOW SHIPPING WITH ACTIVE TERMINATION

ClubMac 4X CD-ROM

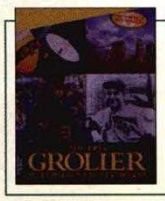
- 600KB/sec data transfer rate
- 190ms average access time
- Caddy-less design
- LED light, headphone jack and RCA jacks
- CharisMac's CD AutoCache driver software
- ONE Year Warranty

$249 C109 9546

ClubMac 2X CD-ROM

- 300KB/sec data transfer rate
- 320ms average access time
- Caddy-less design
- LED light, headphone jack and RCA jacks
- CharisMac's CD AutoCache driver software
- ONE Year Warranty

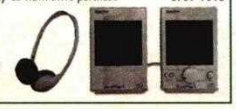
$159 C109 9543



- Grolier 1995 Multimedia Encyclopedia
- U.S. Atlas & World Atlas
- San Diego Zoo Animals
- Wyatt Earp
- QuickShot speakers & Koss Headphones (5 Titles/4 CDs)

CLUBMAC CD-ROM BUNDLE $100* C109 1015

*with any CD-ROM Drive purchase



ClubMac Tape Backup Drives

The ClubMac 2.0GB DAT drive features 20sec average data access time, up to 266KB/sec data transfer rate, SCSI-1/SCSI-2 interface and 60,000 hrs MTBF.

NOW SHIPPING WITH ACTIVE TERMINATION

$729

BUNDLED WITH Retrospect v2.1 Backup Software

C109 5011	**ClubMac 2.0GB DAT**	**$729**
C109 5010	**ClubMac 4-8GB DAT/DDS-2**	**$949**

ClubMac DAT drives includes a 30-Day Money Back Guarantee, TWO Year Warranty, RetroSpect v2.1 Backup Software, ONE 90m DAT tape (ClubMac 4-8GB DAT drive includes ONE 120m DAT tape), 25/50 pin SCSI cable and power cord for external drives, user's guide, and Switchable Active Termination.

ClubMac Optical Drives

ClubMac 5.25" OLYMPUS 1.3GB

- 29ms ave. seek time
- 3,500 RPM rotational speed

$1499 C109 5022

NOW SHIPPING WITH ACTIVE TERMINATION

CLUBMAC 3.5" OLYMPUS 230MB

- 28ms ave. seek time
- 4,200 RPM rotational speed

MacUser February 1995 **$579** C109 5020

ClubMac drives are preformatted and thoroughly tested. ClubMac Optical drives include a 30 Day Money Back Guarantee, ONE Year Warranty, a FREE formatted optical disk, SCSI Director Formatting Software, pre-loaded Apple system software, 25/50 pin SCSI cable and power cord for external drives, user's guide, and Switchable Active Termination.

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Newton MessagePad 100

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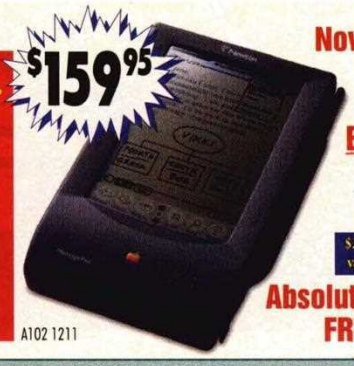
- Newton® Recognition Architecture recognizes both printed and cursive handwriting
- Built-in applications that include a notepad, to-do list, datebook, and name file
- Features a fast 20 MHz Processor, improved 4mb ROM and 64-80K RAM.

$159.95



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GREAT DEAL

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	14" MultiSync XV14 (N026 1016)	$319
	15" MultiSync XV15 (N026 1015)	$435
	15" MultiSync XE15 (N026 1006) / **XP15** (N026 1005)	$549 / 599
	17" MultiSync XV17 (N026 1022) / **XP17** (N026 1009)	$759 / 1049
	21" MultiSync XE21 (N026 1010) / **XP21** (N026 1011)	$1829 / 2199

IntelliColor Display/20e

The Radius IntelliColor Display/20e is part of the next generation in professional two-page color displays. It delivers unrivaled command of your desktop, from on-the-fly resolution switching to state-of-the-art color temperature control. Combined with Radius' IntelliColor software, it allows you to emulate 3 lighting conditions and user-adjustable color temperature, so you get more accurate color representation.

$1979

MONITORS

R016 1013	**PressView 21T Display System** (PV2102) 21" Trinitron, 640 x 480 to 1600 x 1200	$3129
R016 1016	**SuperMatch 21•T XL Trinitron** (STD2102) 21" Trinitron, 1600 x 1200	$2139
R016 1009	**IntelliColor Display/20e** (0461) 20" Trinitron, 640 x 480 to 1600 x 1200	$1979
R016 1007	**PrecisionColor Display/17** (0460) 17" Trinitron, 640 x 480 to 1600 x 1200	$989
R016 1030	**PrecisionView 17** (RD1705) 17" Trinitron, 1024 x 769	$925

VideoVision Studio 2.0

With JPEG hardware compression and decompression for full-screen, full-motion recording and playback from a hard disk, VideoVision Studio combines the power and flexibility of the Macintosh with the ease and transportability of video tape.

$2949†

PowerMac 8100 Compatible !!

MULTIMEDIA SOLUTIONS

R013 1018	**VideoVision Studio 2.0** (0500) NEW and IMPROVED, now compatible with the PowerMac 8100	$2949 †
R013 1020	**VideoVision Studio 2.0 Upgrade** (0505) JPEG daughtercard	$1759
R013 1026	**SpigotPower AV** (DV1630) captures full-screen 24-bit color video up to 30 frames/60 fields per sec	$759
R013 1065	**SpigotPro AV** (0514) captures full-screen 24-bit color video up to 30 frames/60 fields per sec	$1249

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FREE* ColorComposer software

Adobe charged

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R013 1059	**Thunder IV GX•1600** (0513) 24-bit support to 1600 x 1200	$2799
R013 1060	**Thunder IV GX•1360** (0446) 24-bit support to 1360 x 1024	$2289
R013 1061	**Thunder IV GX•1152** (0485) 24-bit support 1152 x 870	$1899
R013 1062	**Thunder/24 GT** (0491) 24-bit support to 1152 x 870, PhotoEngine optional	$1329
R013 1010	**PrecisionColor Pro 24XK** (0430) 24-bit color, 1024 x 768, 16" and larger displays	$749
R013 1008	**PrecisionColor Pro 24X** (0429) 24-bit color, 640 x 480 to 1152 x 870, 13" to 21" displays	$1059

*For a limited time, FREE ColorComposer software is included with each Thunder Series card.
† After $750 Mail-in rebate from Radius. Offer valid until 6/30/95

Printers

NEC

PostScript

BEST BUY

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- 6ppm Print Speed
- 300 dpi print resolution
- 35 True Type fonts
- 3MB RAM standard
- AppleTalk Interface
- Adobe PostScript Level 2 interpreter
- Limited TWO-Year Overnight Replacement Warranty (N027 1001)

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EPSON

Stylus COLOR Inkjet Printer E047 1012

Now you can print in vivid color with clarity never before possible in a personal color printer. At 360 dpi resolution blacks are blacker and at 720/360 dpi the color output is the sharpest available.

- Incredible 720 dpi color printing, optimized with special coated paper
- 360 dpi black print resolution
- Prints up to 16 million colors
- Serial interface
- Includes Mac driver software and a TWO Year Warranty

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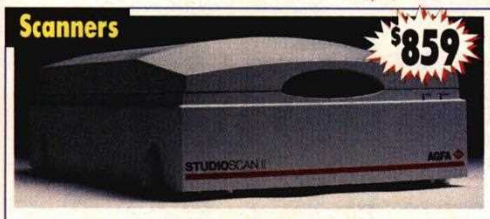
MACWORLD MW ★★★★

Scanners

$859



AGFA StudioScan II

Agfa's StudioScan II, with its speed, flexibility, high-resolution capabilities, color accuracy, and OCR and other bundled software, brings productivity and image quality to novice and desktop users. While maintaining simplicity of operation, StudioScan II features productivity and output quality for demanding environments and applications.

AGFA Agfa

A055 1005	**AGFA StudioScan II**	$859
A055 1004	**AGFA StudioScan**	$679
A055 1007	**Agfa Transparancy Unit II**	$379
A055 1003	**Agfa Transparancy Unit**	$379

EPSON

Epson ES-1200 Pro Mac Scanning System

HIGH DETAIL 4800 DPI, 30-BIT COLOR SCANNING MADE AFFORDABLE.

$1269

- 600 x 1200 dpi scanning resolution (up to 4800 dpi via interpolation)
- Epson's TruePass scanning technology
- Scans over ONE BILLION colors
- 8.5" x 11.67" scanning area
- Built-in image processing features
- Increased image quality with 30-bit color scanning

2 Year Warranty

MACWORLD 1994 Editors' Choice Awards Winner

E045 1003	**Epson ES-1200C Pro-MAC**	$1269
E045 1004	**Transparency Unit**	$655
E045 1008	**Automatic Document Feeder**	$465

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The fastest way to get paper into your Mac.

If it's on paper, it's PaperPort-able!

The first truly simple, super-small input device that converts your paper documents into electronic ones. With PaperPort's direct links to word processors, OCR software (included!), printers and fax modems, you can file, edit, annotate, print and send your documents directly to others. (V025 1002)

$359

MACWORLD MW ★★★★★

Modems

GLOBAL VILLAGE COMMUNICATION

$229

G050 1016

Global Village TelePort Platinum

The Teleport Platinum fax/modem makes it easy to achieve the highest possible performance for both data adn fax communication. You'll save time and money when your use it to send and receive faxes, access your office network from home, transfer files, and connect to on-line services

G050 1016	**Global Village TelePort Platinum**	$229
G050 1006	**Global Village TelePort Gold II**	$109
G050 1017	**Global Village PowerPort Platinum PB 1XX**	$325
G050 1003	**Global Village PowerPort Mercury PB 1XX**	$325

SupraFAXModem

28.8 MC v.34

$225

S140 1006	**Supra Express 14.4 Plus**	$99
S140 1007	**SupraFAXModem 28.8 MC V. 34**	$225
S140 1008	**SupraFAXModem 28.8 PB** V.Fast Class for PowerBooks	$299

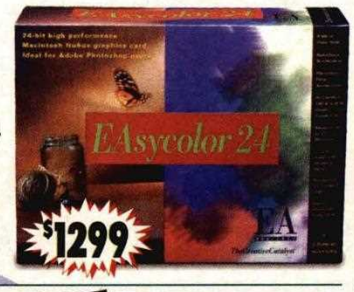
Supra Modems include a FIVE Year Warranty.

Graphic Cards — The Inexpensive Alternative for High-End Color Displays

EA REASEARCH

EAsycolor 24

The EAsycolor 24 graphics accelerator offers an unsurpassed combination of performance and price to creative professionals. In addition to 24-bit resolution up to 1600 x 1200, the EAsycolor 24 also offers Adobe Photoshop, CMYK-RGB, and QuickDraw Acceleration. Ideal for PowerMac owners, the EAsycolor 24 features state of the art RISC technology, up to 8MB VRAM, a 30 day money-back guarantee and a lifetime warranty at a very competitive price.



$1299

E103 1001	**EAsycolor 24 1152 Graphics Card** (EC1152)	$1299
E103 1002	**EAsycolor 24 1360 Graphics Card** (EC1360)	$1699
E103 1003	**EAsycolor 24 1600 Graphics Card** (EC1600)	$2299

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PaintBoard Prism GT bundled with Painter 3.0

NEW PRODUCT

Prism delivers top performance – real-world performance – for the way that people really work. Prism provides a balance of price, performance and functionality that are unmatched

- Accelerated 24-bit color at resolutions up to 1152 x 870
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R053 1029	**PaintBoard Prism GT bundled with Painter 3.0**	$959
R053 1028	**PaintBoard Prism**	$659

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IN STOCK!

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100MHz

Compatible with Mac IIci, IIsi, IIvx, and Performa 600

The Turbo 601 provides the best of both worlds. The Turbo 601 allows you to run your current software up to twice as fast, and it lets your run powerPC accellerated applications at full PowerPC speed - from 7 to 11 times faster!

	DayStar 100 MHz Turbo 601 Compatible with Mac IIci (D040 1048), IIsi (D040 1050), IIvx/vi/Performa 600 (D040 1052)	$1489 *
	DayStar 100 MHz PowerPro 601 (D040 1043) Compatible with Quadra 900/950, 700 and other with Quadra style PDS	$1489 *
	DayStar 66 MHz Turbo 601 Compatible with Mac IIci (D040 1039), IIsi (D040 1049), IIvx/vi/Performa 600 (D040 1051)	$989
	DayStar 66 MHz PowerCard 601 (D040 1040)	$635
	DayStar Turbo '040 (D040 1018)	$769

* After $200 Mail-in rebate from DayStar Digital.

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Mac Con LC-10T III

(A120 1026)

Mac Con LC-10T III is a great low cost 10BaseT solution for LCs, Quadra 605s, 630s and many Performa models

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SPECIAL BUY! Limited Quantities Available

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A120 1032	Micro AsantéPrint, 10BT (AP10T)	$285
A120 1033	Micro AsantéPrint, Thk/Thn/10BT (AP3)	$309
A120 1010	10BaseT FriendlyNet Media Adapter (FN10TA)	$39.99
A120 1025	Mac II/Perf 600, NuBus, Thk/Thn (MCiNB-TN)	$115
A120 1023	Mac II/Perf 600, NuBus, Thk/10BT (MCiNB-10T)	$109
A120 1022	Mac LC/Q6xx/Clr Classic, Thn, FPU (MCiLC-TN)	$109
A120 1037	Mac LC/Q6xx/Clr Classic, 10BT, FPU (MCiLC-10T)	$89

WARRANTIES: All items manufactured by ClubMac are returned to ClubMac for warranty repair. All other items carry manufacturer's warranty. **MONEY BACK GUARANTEE:** All products manufactured by ClubMac carry a 30 day money back guarantee. ClubMac extends all other manufacturers' return policies to its customers. Non-ClubMac products carry 30 day money back guarantee when specified. **RETURNS:** Call for RMA number! Any product that is returned WITHOUT an RMA number will be refused. ALL PRODUCT INFORMATION AND PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS.

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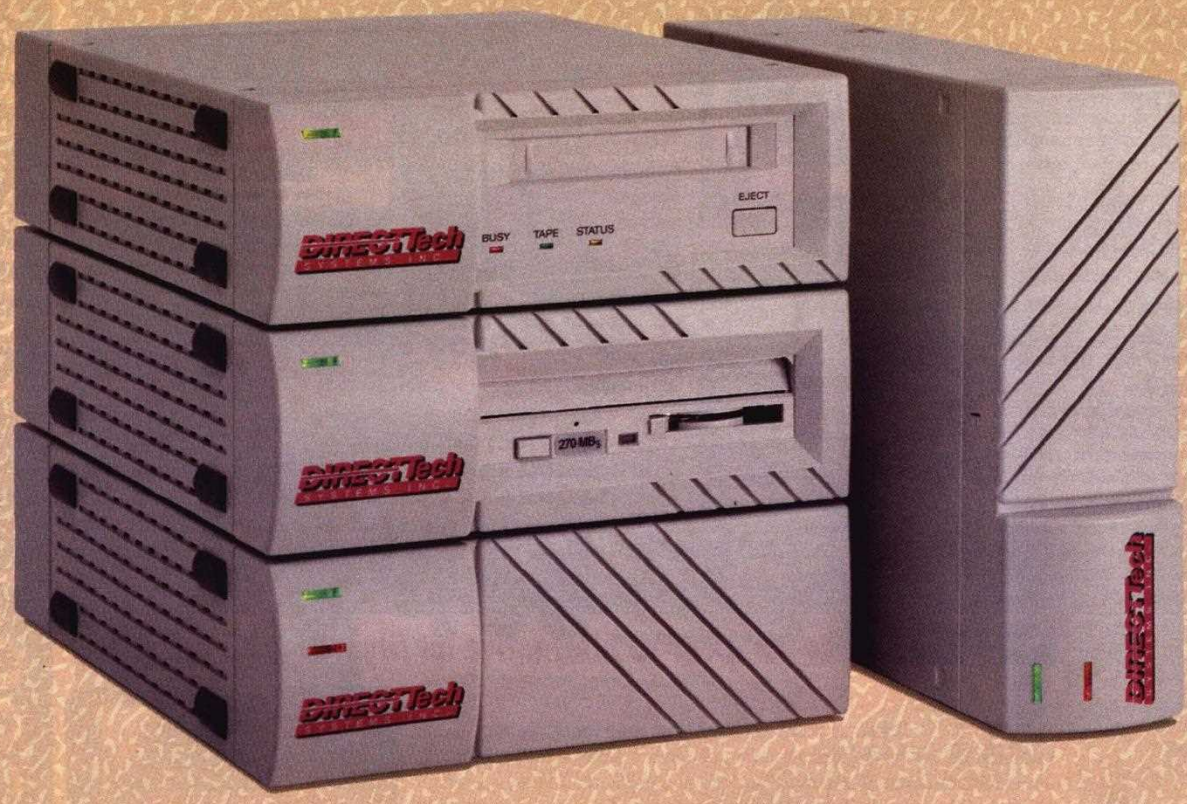
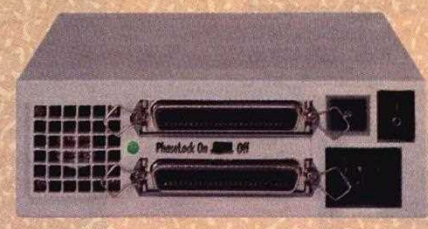


Phaser Enclosures can also be set on end.



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ALL DRIVES ARE PREFORMATTED, TESTED AND PACKAGED WITH SCSI MANAGER 4.3 COMPATIBLE DRIVERS. EXTERNAL DRIVES INCLUDE CHOICE OF 25-50 OR 50-50 PIN CABLE.

Capacity	Model No.	Mechanism	Size	Seek	RPM	Warranty	Internal	PHASER-I
365 MB	DT-365LT	Quantum	3.5"	11 ms	4500	2 yrs	$195	$270
540 MB	DT-540LT	Quantum	3.5"	11ms	4500	2 yrs	$235	$310
730 MB	DT-730LT	Quantum	3.5"	11 ms	4500	2 yrs	$275	$350
1.0 GB	DT-1080AL	Quantum	3.5"	9.5 ms	7200	5 yrs	$590	$665
1.05 GB	DT-31230	Seagate	3.5"	9.0 ms	5400	5 yrs	$515	$595
2.0 GB	DT-3221	Micropolis	3.5"	8.5 ms	7200	5 yrs	$950	$1,025
2.0 GB	DT-32150	Quantum	3.5"	8.0 ms	7200	5 yrs	$990	$1,065
2.0 GB	DT-2490	HP	3.5"	9.0 ms	6400	5 yrs	$1,100	$1,185
2.1 GB	DT-32550	Seagate Barracuda	3.5"	8.0 ms	7200	5 yrs	$1,050	$1,125
2.1 GB	DT-32550W	Seagate Barracuda Wide	3.5"	8.0 ms	7200	5 yrs	$1,199	$1,299
4.3 GB	DT-3243	Micropolis	3.5"	8.5 ms	7200	5 yrs	$1,395	$1,475
4.3 GB	DT-15150	Seagate Barracuda	3.5"	8.0 ms	7200	5 yrs	$1,499	$1,579
4.3 GB	DT-15150W	Seagate Barracuda Wide	3.5"	8.0 ms	7200	5 yrs	$1,599	$1,799
4.3 GB	DT-4280	Quantum	3.5"	8.0 ms	7200	5 yrs	$1,195	$1,275
9.0 GB	DT-1991	Micropolis	5.25"	12 ms	5400	5 yrs	$2,275	$2,375
9.0 GB	DT-410800	Seagate Elite 9	5.25"	11 ms	5400	5 yrs	$2,750	$2,850

AUDIO/VIDEO TUNED HARD DRIVES

Capacity	Model No.	Mechanism	Size	Seek	RPM	Warranty	Internal	PHAZER-I
1.05 GB	DT-31230AV	Seagate	3.5"	9 ms	5400	5 yrs	$565	$645
2.0 GB	DT-3221AV	Micropolis	3.5"	8.5 ms	7200	5 yrs	$1,000	$1,080
2.1 GB	DT-32550AV	Seagate Barracuda	3.5"	8.0 ms	7200	5 yrs	$1,100	$1,180
4.3 GB	DT-3243AV	Micropolis	3.5"	8.5 ms	7200	5 yrs	$1,395	$1475
4.3 GB	DT-15150AV	Seagate Barracuda	3.5"	8.0 ms	7200	5 yrs	$1,550	$1,630
9.0 GB	DT-1991AV	Micropolis	5.25"	12 ms	5400	5 yrs	$2,499	$2,599
9.0 GB	DT-410800AV	Seagate Elite 9	5.25"	11 ms	5400	5 yrs	$2,800	$2,900

SYQUEST

INCLUDES ANUBIS FORMATTING SOFTWARE AND ONE CARTRIDGE

Capacity	Model No.	Internal	PHASER-I
88 MB	SQ5110C	$305	$365
200 MB	SQ5200	$420	$480
270 MB	SQ3270	$420	$470

TAPE

INCLUDES A FREE COPY OF RETROSPECT AND ONE TAPE

Capacity	Model No.	Format	PHASER-I
2 GB	HP-35470	4mm	$995
4-8 GB	Sony-5000	DDS-2	$1,165
4-8 GB	HP-1533A	DDS-2	$1,360
5-10 GB	Exabyte-8505	8mm	$2,275
10-20 GB	DLT-2000	DLT	$3,599

OPTICAL

INCLUDES ANUBIS FORMATTING SOFTWARE AND ONE CARTRIDGE

Capacity	Model No.	Seek	PHASER-I
230 mb	Fujitsu	30 ms	$675
1.3 GB	HP-C1716	23 ms	$2,099
1.3 GB	Maxoptix T-III	18 ms	$2,199

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Capacity	Model No.	Raid Level	External
2.0 GB	DT-31200-2AR	0, 1	$ Call
4.0 GB	DT-32550-2AR	0, 1	$ Call
8.0 GB	DT-15150-2AR	0, 1	$ Call

These drives are perfect for Videovision.

MEDIA

Type	Price	Type	Price
Syquest 44	$42	Optical 128 MB	$26
Syquest 88	$48	Optical 230 MB	$30
Syquest 105	$54	Optical 1.0 GB	$100
Syquest 200	$76	Optical 1.3 GB	$95
Syquest 270	$60		

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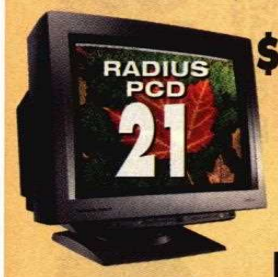

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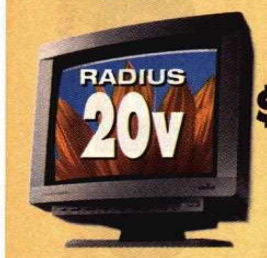

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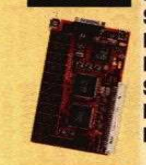

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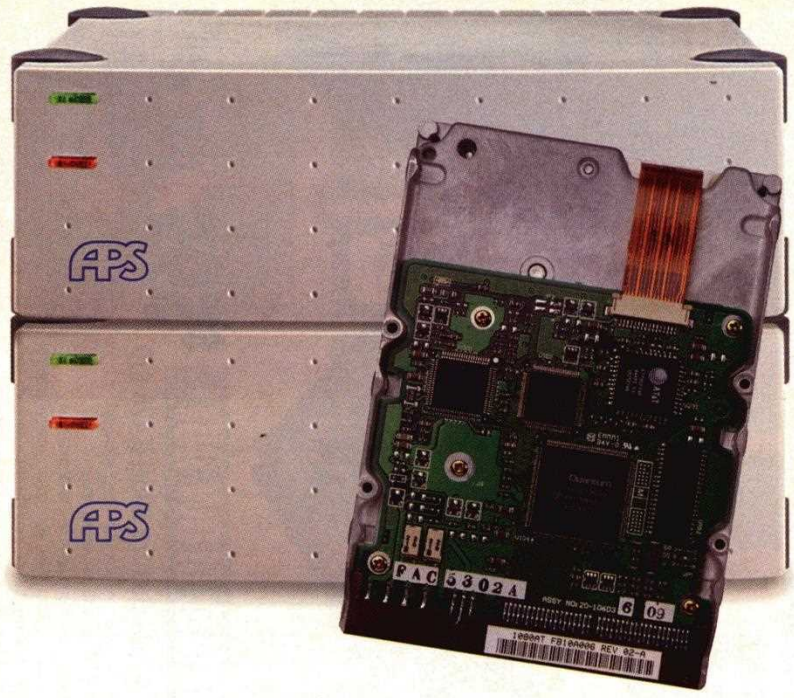
Internal configuration



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	Model	Capacity	Internal	SR2000
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	APS Q 540[3] Quantum 540 Fireball mechanism	516MB	199.95	299.95
MacUser ZD LABS 4½	APS Q 730[2] Quantum 730 Lightning mechanism	699MB	229.95	329.95
	APS Q 840[3] Quantum 840 Trailblazer mechanism	811MB	299.95	399.95
	APS Q 1080[3] Quantum 1080 Fireball mechanism	1042MB	399.95	499.95
MacUser ZD LABS 4½	APS ST 1.0[5] Seagate ST 31230N Hawk mechanism	1010MB	549.95	649.95
	APS Q 1.0[5] Quantum Atlas XP31070 mechanism	1025MB	699.95	799.95
MacUser ZD LABS 4½	APS MS 2.0[5] Micropolis 4221 mechanism	1955MB	899.95	999.95
	APS ST 2.0[5] Seagate ST 32550N Barracuda	2047MB	999.95	1099.95
	APS Q 2.0[5] Quantum Atlas XP32150 mechanism	2050MB	999.95	1099.95
	APS MS 2.0AV[5] Micropolis 4221AV mechanism	1955MB	999.95	1099.95

4064-8669MB

	Model	Capacity	Internal	SR2000
MacUser ZD LABS 4	APS MS 4.0[5] Micropolis 3243 mechanism	4064MB	$1399.95	$1499.95
	APS MS 4.0AV[5] Micropolis 3243AV mechanism	4064MB	1499.95	1599.95
MacUser ZD LABS 4½	APS ST 4.0[5] Seagate ST 15150N mechanism	4094MB	1499.95	1599.95
	APS Q 4.0[5] Quantum Atlas XP34300 mechanism	4101MB	1499.95	1599.95
	APS MS 9.0[5] Micropolis 1991 mechanism	8669MB	2299.95	*2499.95
	APS MS9.0AV[5] Micropolis 1991AV mechanism	8669MB	2399.95	*2599.95
MacUser ZD LABS 5	APS ST 9.0[5] Seagate ST410800N mechanism	8669MB	2699.95	*2899.95

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	Model	Capacity	Internal	**AC Only
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	APS Q 514[1]	491MB	379.95	N/A
	APS T 504[1]	504MB	399.95 NEW FROM APS	$499.95*
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ARRAID M2/7200[5]	2GB	Mirrored (1)	2499.95
ARRAID S4/7200[5]	4GB	Striped (0)	2499.95
ARRAID S8/7200[5]	8GB	Striped (0)	3299.95

DATerm™ patent pending
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Internal drives for Quadra 800 and Centris 610 available
Listed capacities are formatted
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1-5 Denotes length of manufacturer's warranty in years
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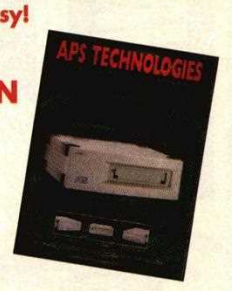

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APS HyperDAT²	8GB†	949.95	999.95
APS DLT20²	20GB†	—	3999.95
APS DLT40² NEW FROM APS	40GB†	—	5499.95

*Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.
† 2:1 Hardware data compression.
✚Native capacity without data compression.
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DLT40 Data cartridge	109.95	—	—
DLT20 3PK cartridges	119.95	—	—
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Model	Capacity	SR2000
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APS SQ 5200² MacUser RECOMMENDS	194MB††	MacUser ZD LABS ★★★★½ 499.95

†† Does not format 44MB & 88MB cartridges
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Prices listed are for unformatted media

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Model		SR2000
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1-5 Denotes length of manufacturer's warranty in years
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Classic II	$59

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230 Optical	$705

Rumi CD-ROM Drives

2x Multisession Photo CD	$185

Rumi SyQuest Drives

Rumi 200 or 270MBw/FREE Cart	$539
Rumi 88 or 105MBw/FREE Cart	$379

Rumi Hard Drives

Rumi 340MB Int / Ext (Quantum)	$195 / $269
Rumi 540MB Int / Ext (Quantum)	$259 / $325
Rumi 1.0GB Int / Ext (Quantum)	$645 / $705
Rumi 2.1GB Int / Ext (Quantum)	$1085 / $1145
Rumi PowerBook 510MB Internal	$479

Zip Drives

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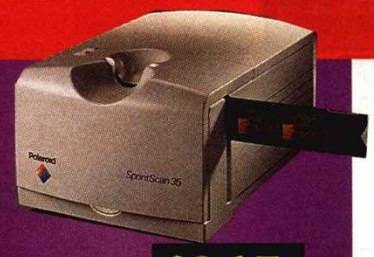

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Scan 35mm slides up to 2700 dpi - in under a minute!
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CoolScan LS-10 Slide Scanner	$1379
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ScanMaker III	$2259
ScanMaker II	$479

Sharp

JX-330A	$999

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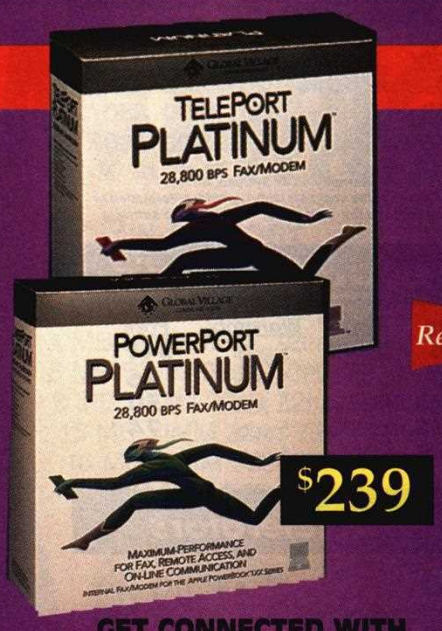

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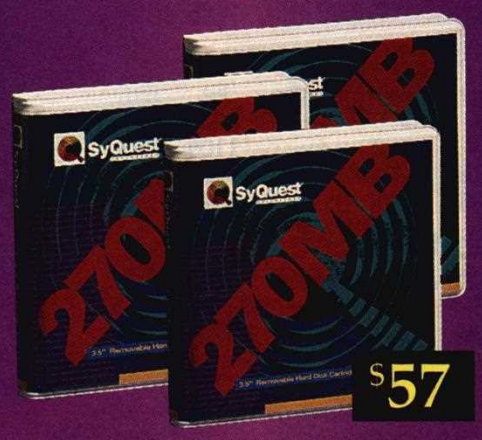

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The Original SyQuest Cartridge

	1-4	5-9	10+
44MB 5.25"	$42	$41	$40
88MB 5.25"	$48	$47	$46
200MB 5.25"	$76		$75
270MB 3.5"	$59	$58	$57
105MB 3.5"	$55		$54

*After Mfg. Rebate

Sony

5.25" MO 1.3GB / 1.2GB ..... $85 / 2 Pack $153*
3.5" MO 230MB ..... $35 / 5 Pack $149*
3.5" MO 128MB ..... $2 / 5 Pack $104*
All Audio & Video Products.

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CDR 74 Mn 4x (10 pack) $89
All Verbatim Data Products.

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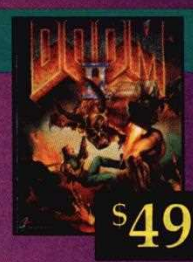

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CD-ROM CADDY..... $13
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CD-ROM

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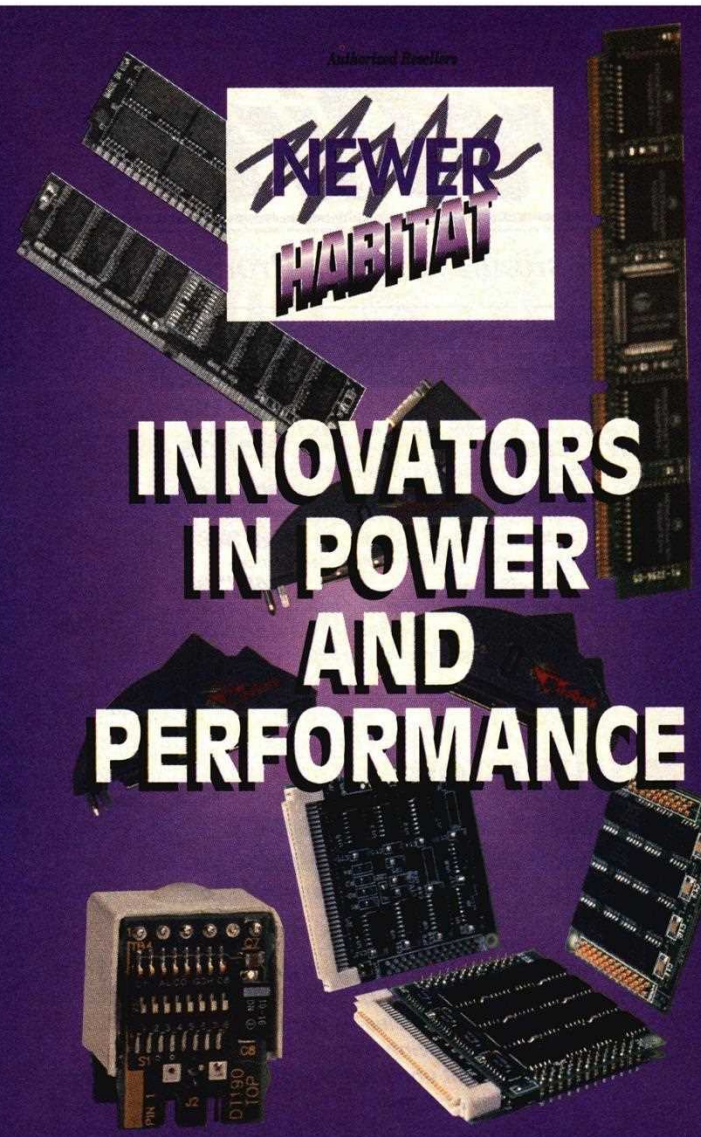

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CD ROM Drives

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280ms access time, 300Kb/sec transfer rate,256K,1 Year Warranty

SONY CDU55 — 235/275
280ms access time, 300Kb/sec transfer rate

NEC 2VMac — 205/245
320ms access time, 300Kb/sec transfer rate, 1 Year Warranty

NEC 3Xp — na/398
240ms access time, 500Kb/sec transfer rate, 1 Year Warranty

Toshiba QuadSpeed — 340/380
120ms access time, 600Kb/sec transfer rate, 256K,1 Year Warranty

NEC 4Xe — 445/485
220ms access time, 600Kb/sec transfer rate,256K,1 Year Warranty

Plextor 4Plex — 385/425
235ms access time, 600Kb/sec transfer rate, 256K,1 Year Warranty

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Removable Drive Carriers

- **Provides ability to easily remove and transport data**
- **Ideal for disk array environments**
- **Compatible with single ended, narrow differential, or fast & wide SCSI disk drives**
- **SCSI ID select number is clearly displayed on front panel of the receiving frame**
- **Key locked to prevent unauthorized or untimley removal of the drive carrier**
- **5 year warranty**

"Kingston Data Silo's are ideal for enclosing 5.25" and 3.5" storage devices, including disks, tapes, DATs or optical drives for external SCSI expansion". Kingston Technology Corp.1994

Digital Linear Tape Drives

Quantum DLT

Model	Capacity	Trans.Rate	Media	Ext.
DLT2000	20 GB	2.5MB/sec.	DLT20	$2995
DLT4000	40 GB	3.0MB/sec.	DLT40	$Call!

1 free cartridge with each DLT purchase

These drives are ideal for AV and network backup due to their advanced linear recording technology and a highly accurate tape guide system . DLT allows you to backup 150 to 180 MB per minute. DLT is your high capacity high performance backup solution.

Optical Drives

	Capacity		Access	Warranty	Ext.
Hewlett Packard	1.3 GB	1716T	23.5ms	1 Year	2295
MaxOptics	1.3 GB	Tahitti III	18ms	1Year	2395
Fujitsu	230 MB	M2512	30ms	1Year	575

1 free cartridge with each drive purchase

Hard Drive Cabinets

Zero Footprint 10.75" x 9.75" x 2" $75
MicroCab 8.5" x 6.75" x 2" $85
Full Height 9.75" x 9.5" x 4.5" $135
Multi Bay Cabinets ..... $CALL
Two, four, six, and eight bay cabinets available. All cabinets come with a 25-50 pin Mac system cable and a power cable. 1 year warranty on all cabinets.

Scanners

Nikon	Scantouch	$1299
	Transparency Adapter	$599
	Coolscan	$1499
UMAX	UC630/1260	$675/1240
	Vista S6	$760
	Powerlook	$3250

All prices are subject to change without notice. Returned products are subject to a restocking fee. International customers pay all shipping charges. All shipping charges are non-refundable. To return merchandise call for an RMA number. All RMAs must be returned within 10 business days of issuance. Customers are responsible for all returned product shipping charges.

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NEW Quantum Quantum Quantum

	Capacity	Seek	RPM	Cache	Warranty	Int.	Ext.
LPS Series	170 MB	14 ms	3600	128K	2 Year	135	195
LPS Series	340 MB	11 ms	4500	128K	2 Year	155	215
Trailblazer	420 MB	14 ms	4500	128K	3 Year	185	245
DSP3053	535 MB	9 ms	5400	512K	2 Year	225	285
Maverick	540 MB	14 ms	3600	128K	2 Year	190	250
Fireball	540 MB	11 ms	5400	128K	3 Year	195	255
Lightning	730 MB	11 ms	5400	128K	2 Year	255	315
Trailblazer	850 MB	14 ms	4500	128K	3 Year	289	349
Fireball	1080 MB	11 ms	4500	128K	3 Year	395	455
Empire	2100 MB	9.5 ms	5400	512K	5 Year	890	950
Atlas Series	2.0 GB	9ms	7200	1024K	5 Year	925	985
Grand Prix	4200 MB	8.6 ms	7200	512K	5 Year	1135	1195
Atlas Series	4.3 GB	9ms	7200	2048K	5 Year	1495	1555

	Capacity	Size	Seek	Cache	Warranty	Int.	Ext.
Daytona	256 MB	Powerbook 2..5"	17 ms	128K	1 Year	215	275
Daytona	341 MB	Powerbook 2..5"	17 ms	128K	1 Year	295	355
Daytona	514 MB	Powerbook 2..5"	17 ms	128K	1 Year	395	455

New Products MICROPOLIS MICROPOLIS New Pricing!!

	Capacity	Access	RPM	Cache	Warranty	Int.	Ext.
M4221	2.1 GB	8.5 ms	7200	512K	5 Year	935	995
M4221Wide	2.1 GB	8.5 ms	7200	512K	5 Year	1080	1140
M1936	3.6 GB	11 ms	5400	512K	5 Year	1195	1295
M3243	4.3 GB	8.5 ms	7200	512K	5 Year	1385	1445
M3243Wide	4.3 GB	8.5 ms	7200	512K	5 Year	1475	1535
M1991	9.0 GB	12 ms	5400	512K	5 Year	2195	2295
M1991Wide	9.0 GB	12 ms	5400	512K	5 Year	2295	2395

Direct to Disk Recording AV Drives- BEST for Music and Video Storage

M4221AV	2.1 GB	8.5 ms	7200	512K	5 Year	995	1055
M1936AV	3.6 GB	11 ms	5400	512K	5 Year	1245	1345
M3243AV	4.3 GB	8.5 ms	7200	512K	5 Year	1485	1545
M1991AV	9.0 GB	12 ms	5400	512K	5 Year	2325	2425
M4221WideAV	2.1 GB	8.5 ms	7200	512K	5 Year	1135	1195
M3243WideAV	4.3 GB	8.5 ms	7200	512K	5 Year	1595	1655
M1991WideAV	9.0 GB	12 ms	5400	512K	5 Year	2495	2595

NEW MICRODISK LT *3.5"Stackable Disk Subsystems, Super Capacity External Storage*

M2100	2.1 GB	8.9 ms	7200	512K	5 Year	Call for the most
M4200	4.3 GB	8.9 ms	7200	512K	5 Year	competitive pricing

SPRING SPECIALS

Quantum 170MB ..... Int. $135 Ext. $195
3600RPM, 14ms seek, 128K cache, 2 year warranty

Quantum 340MB ..... Int. $155 Ext. $215
4500RPM, 12ms seek, 128K cache, 2 year warranty

Quantum535MB ..... Int. $225 Ext. $285
DSP3053, 5400RPM, 9ms seek, 512K cache, 2 year warranty

Quantum Trailblazer 850MB ..... Int. $289 Ext. $349
QTB850, 4500RPM, 14ms seek, 128K cache, 3 year warranty

Quantum Fireball 1.0GB ..... Int. $395 Ext. $455
QFB1080, 4500RPM, 11ms seek, 2 year warranty

Micropolis 2.0GB ..... Int. $935 Ext. $995
M4221,7200RPM, 9ms seek, 5 year warranty

Seagate Barracuda 4.0GB ..... Int. $1495 Ext. $1555
ST15150N, 7200RPM, 8ms seek, 5 year warranty

Seagate Seagate Seagate Seagate

	Capacity		Seek	RPM	Cache	Warranty	Int.	Ext.
Hawk 2LP	1.2 GB	ST31230N	9ms	5400	512K	5 Year	535	595
Hawk 4	4.2 GB	ST15230N	9ms	5400	512K	5 Year	1335	1495
Barracuda 2LP	2.5 GB	ST32550N	8ms	7200	1024K	5 Year	1050	1110
Barracuda 4	4.2 GB	ST15150N	8ms	7200	1024K	5 Year	1495	1555
Barracuda 2Wide	2.5 GB	ST32550Wide	8ms	7200	1024K	5 Year	1125	1195
Barracuda 4Wide	4.2 GB	ST15150Wide	8ms	7200	1024K	5 Year	1590	1650
Elite 9	9.0 GB	ST410800N	11ms	5400	512K	5 Year	2595	2695

FUJITSU FUJITSU FUJITSU FUJITSU FUJITSU FUJITSU

	Capacity	Seek	RPM	Cache	Warranty	Int.	Ext.
M2684	530 MB	9ms	4500	256K	5 Year	205	265
M1606SA	1.2 GB	9ms	4500	512K	5 Year	515	575

HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD

	Capacity	Access	RPM	Cache	Warranty	Int.	Ext.
C3724SE	1.2 GB	9.5 ms	5400	512K	5 Year	550	610
C2490SE	2.4 GB	8.5 ms	6300	512K	5 Year	1095	1155

All in Stock! SyQuest TECHNOLOGY

Capacity		Seek	RPM	Int.	Ext.
88 MB	SQ5110C	20 ms	3200	$305	$365
200 MB	SQ5200	18 ms	3200	420	480
270 MB	SQ3270	13.5 ms	3200	420	480

2 Year Warranty on all SyQuest Drives.
SyQuest drives come complete with 1 cartridge(Formatted or Unformatted) and the latest SCSI 4.3 compatible software

SyQuest TECHNOLOGY Media

Capacity	Model	Warranty	Price
44 MB	SQ400	5 year	$41
88 MB	SQ800	5 year	46
105 MB	SQ310	5 year	50
200 MB	SQ2000	5 year	74
270 MB	SQ327	5 year	63

SCSI-2 Accelerators

Atto

Silicon Express Fast SCSI-2 — 525
SCSI 1 & 2 support,transfer rates up to 10.0 MB/sec,supports multiple block sizes,takes advantage of parallel processing capability by transferring data directly between the Mac RAM and the SCSI bus! Ideal for graphic design,multimedia applications,software design, and more!

Silicon Express 4 Card — 895
Fast/Wide (16Bit) SCSI-2 accelerator card for Apple's Nubus based computers. Supports Fast/Wide SCSI 2 (16 Bit) transfer rates up to 20MB/sec., and fast SCSI-2 (8 Bit) transfer rates up to 10MB/sec. Full 16 Bit WIDE support for the latest drives and disk arrays . Fully compatible with all existing SCSI-1 drives . Formatting software is included. 5 Year Warranty.

Remus RAID Software — Call

Tape Backup Drives

HEWLETT PACKARD

Capacity	Model	Media	Int.	Ext.
2.0 GB	35470	4mm	$935	$985
3-5 GB	35480	4mm	1105	1150
4-10 GB	1533A	4mm	1235	1295
20-50 GB	1553A Auto Tape Loader		3495	3595

Exabyte

Capacity	Model	Media	Int.	Ext.
2-5 GB	8205	8mm	$1395	$1485
7-14 GB	8505XL	8mm	2175	2240

Dat drives include 1 piece of media and Retrospect Software

DeskTape™ Allows you to mount your DAT on the desktop. Backing up your data is as easy as drag and drop!

ProDirect always suggests that our customers backup their hard drives. In the event of hard drive failure, be assured and back up your data with quality tape backup drives from Hewlett Packard and Exabyte.

Memory Products

Memory	Centris,LCIII,Quadra
2x8x80	4MB 60/70ns
4x8x80 60/70ns	8MB 60/70ns
4x8x80 FX	16MB 70ns
16x8x80 Low Profile	32MB 60ns
16x8x80 FX	VRAM 256K/512K

Powerbook Memory
520,520C,540,540C
4MB,8MB,16MB,32MB
140,170,160,165C,180,180C,Duos
4MB,6MB,8MB,10MB, 12MB,14MB,20MB

Lifetime Warranty on all Memory Products!!

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72 Pin Memory
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8 MB SIMM 32bit 72pin 60ns	$305
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16 MB SIMM 32bit 72pin 60ns	$519
32 MB SIMM 32bit 72pin 60ns	$1059
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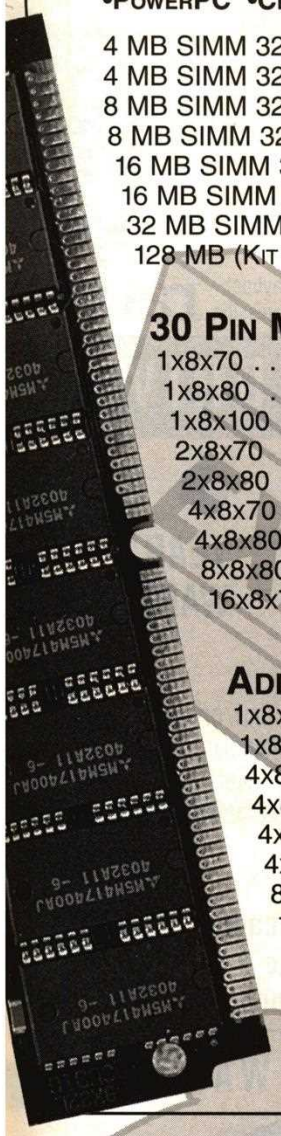
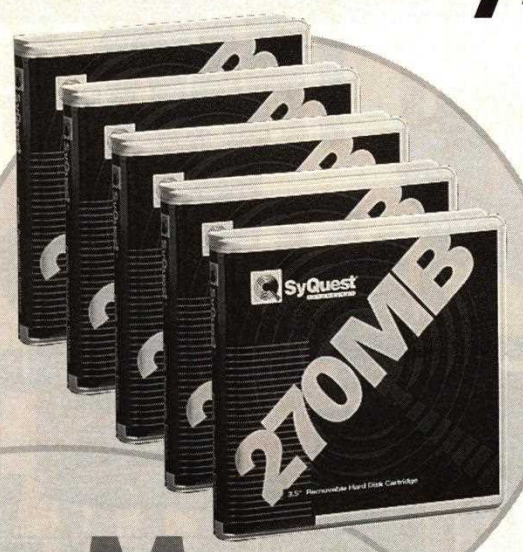
1x8x70	$38
1x8x80	$36
1x8x100	$32
2x8x70	$80
2x8x80	$78
4x8x70	$137
4x8x80	$135
8x8x80	$317
16x8x70 (low profile)	$599

Additional Memory

1x8x80 (IIfx & NTX)	$36
1x8x70 (IIfx)	$38
4x8x80 (II, IIx) PAL	$138
4x8x70 (II, IIx) PAL	$140
4x8x80 (IIfx)	$136
4x8x70 (IIfx)	$138
8x8x70 (IIfx)	$315
16x8x70 (IIfx)	$679
1x9x70 (IBM)	$43
4x9x70 (IBM)	$161
1x36 - 4 MB	$179
2x36 - 8 MB	$345
8x36 - 32MB	$1339





More Media

SyQuest Cartridge 44MB	$42
SyQuest Cartridge 88MB	$48
SyQuest Cartridge 105MB	$55
SyQuest Cartridge 200MB	$76
SyQuest Cartridge 270MB	$59
Sony 3.5" Floppy Disks 2SHD	$6.90
Verbatim 128MB MO cartridge	$28
Verbatim 230MB MO Cartridge	$35
Verbatim 600MB MO Cartridge	$69
Verbatim 1.3GB MO Cartridge	$82
Verbatim CD-R 74 Min. 650MB	$13.99
Iomega Zip100 Media Cartridge	$19
Bernoulli 230MB Single Cartridge	$96
Bernoulli 230MB 5-pk Cartridge	$455

PowerBook Accessories

Battery for PB140/180	$49
Battery for PB100	$49
Charger for PB140/180	$89
Mini A/C Adapter for PB140/180	$50
Mini A/C Adapter for PBDuo	$50
Slimpack for PB100/180C	$145
Slimpack for PBDuo	$235
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Kensington Thinking Mouse	$99
Kensington Keyboard Mac 101E	$89

PowerBook Memory

PowerBook Memory

4 MB Upgrade– PB100	$167
6 MB Upgrade– PB100	$175
4 MB Upgrade– PB140/145/145B/17	$94
6 MB Upgrade– PB140/145/170	$135
4 MB Upgrade– PB160/165/180	$95
6 MB Upgrade– PB160/165/180	$148
8 MB Upgrade– PB160/165/180	$215
10 MB Upgrade– PB160/165/180	$275
4 MB Upgrade– PB165C/180C	$145
6 MB Upgrade– PB165C/180C	$165
8 MB Upgrade– PB165C/180C	$215
10 MB Upgrade– PB165C/180C	$405

PowerBook DUO 210-280C

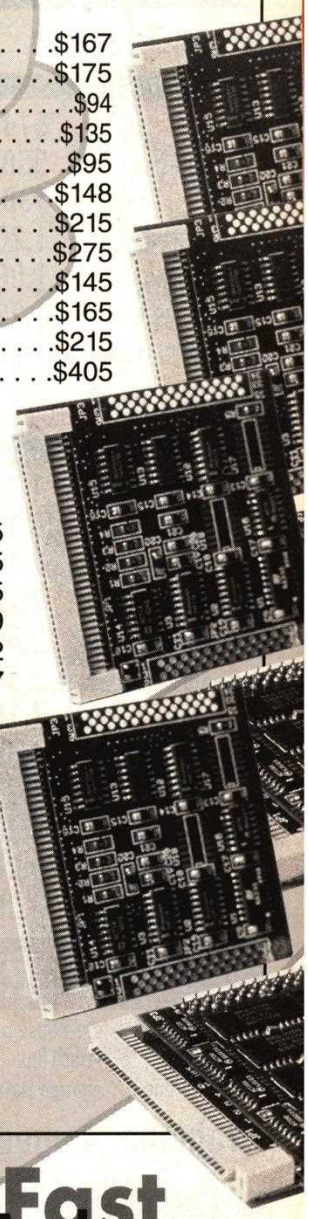
4MB Upgrade	$165
8MB Upgrade	$325
12MB Upgrade	$475
14MB Upgrade	$559
20MB Upgrade	$792
28MB Upgrade	$1,197

PowerBook 150 Series

4 MB RAM Module	$179
8 MB RAM Module.	$342
14 MB RAM Module	$587

PowerBook 500 Series

4 MB RAM Module	$179
8 MB RAM Module.	$315
16 MB RAM Module	$627
32 MB RAM Module	$1,229



Rumi Drives

FREE CARTRIDGE !
(WITH RUMI SYQUEST DRIVES)

88MB SyQuest w/cart	$379
105MB SyQuest w/cart	$379
200MB SyQuest w/cart	$529
270MB SyQuest w/cart	$529
Rumi CD-ROM 2X	$185
Rumi 230MB MO	$705

Rumi Quantum Drives

Rumi 160MB Int/Ext	$189/$255
Rumi 365MB Int/Ext	$229/$285
Rumi 540MB Int/Ext	$259/$325
Rumi 730MB Int/Ext	$319/$385
Rumi 1GB Int/Ext	$645/$705
Rumi 2.1GB Int/Ext	$1085/1145
IOMEGA Zip100 Ext	$199
Bernoulli 230 Drive	$459

Necessary Accessories

Math CoProcessors

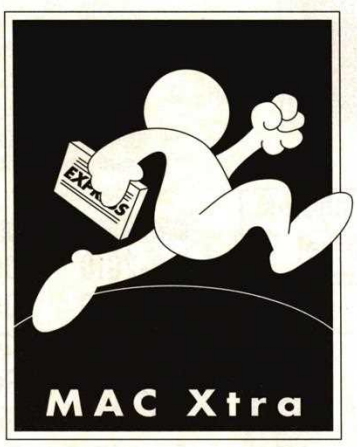
LC & LCII 16mhz	$49
LCIII 25mhz	$48
LC575 33mhz 040	$350
Classic II 16mhz	$55
Color Classic 16mhz	$48
Duo/P600 33mhz	$55
Centris 25mhz CPU repl	$299

Video Ram

Video Ram 256K	$20
Video Ram 512K	$38

Cache /PowerMacs 6100, 7100

256K Cache	$119
512K Cache	$445
1MB Cache	$859



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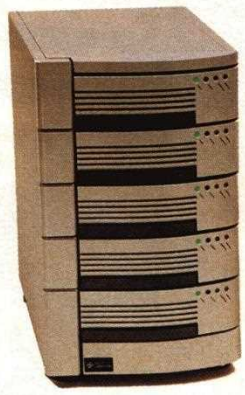

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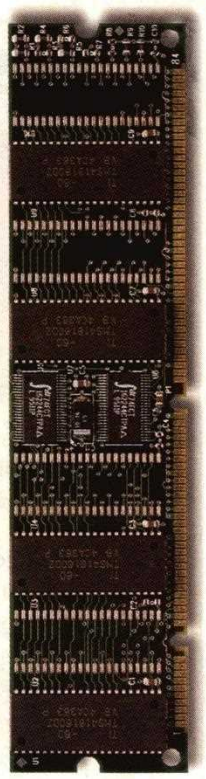

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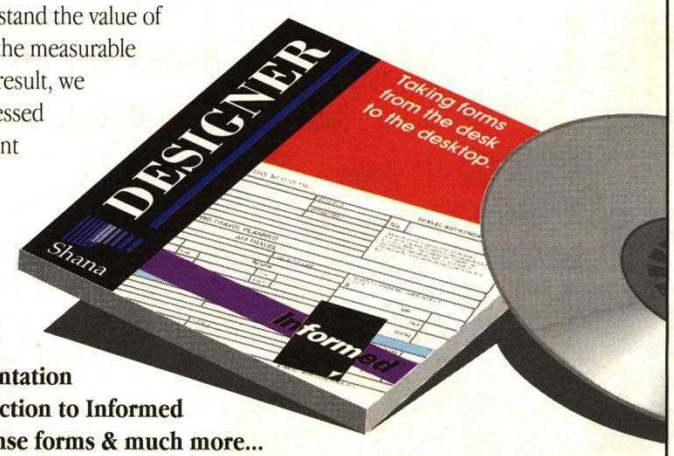

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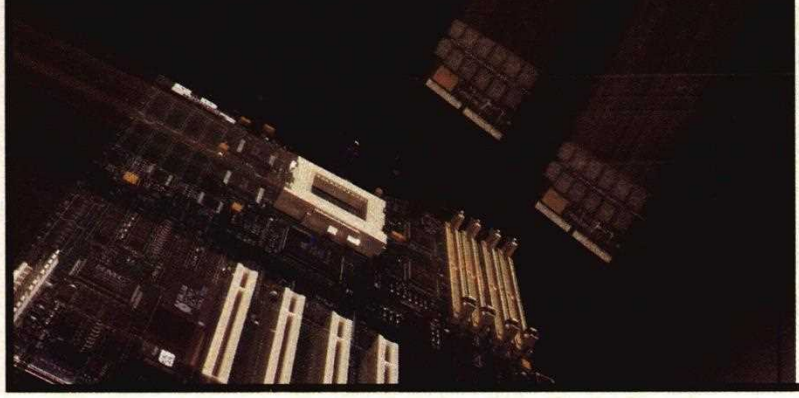

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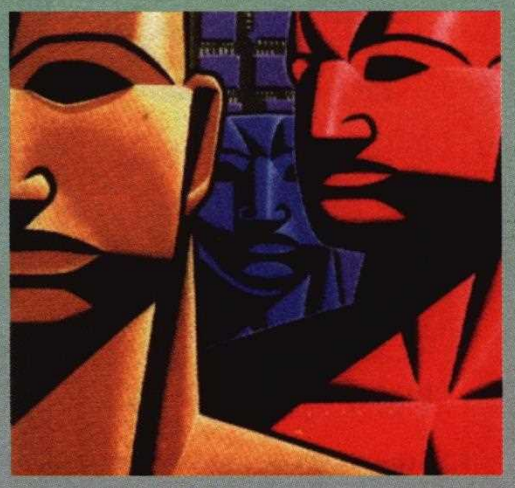

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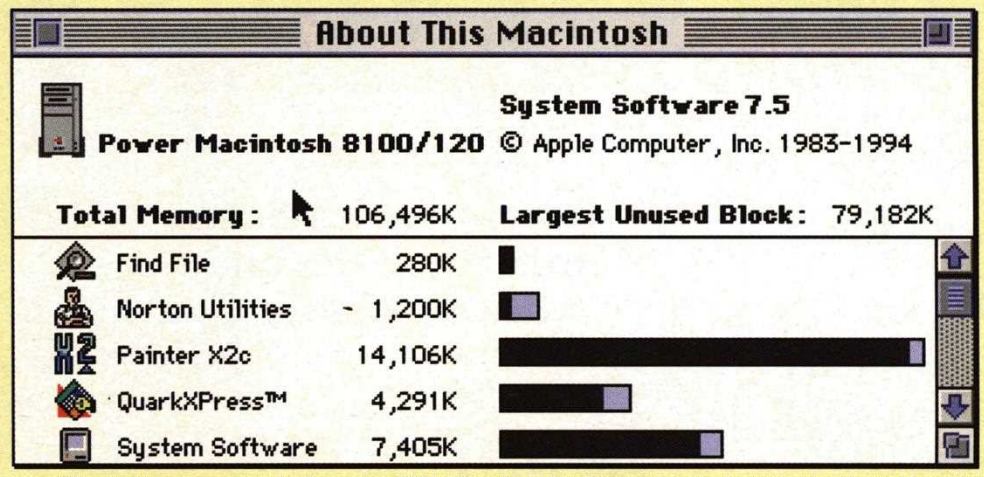

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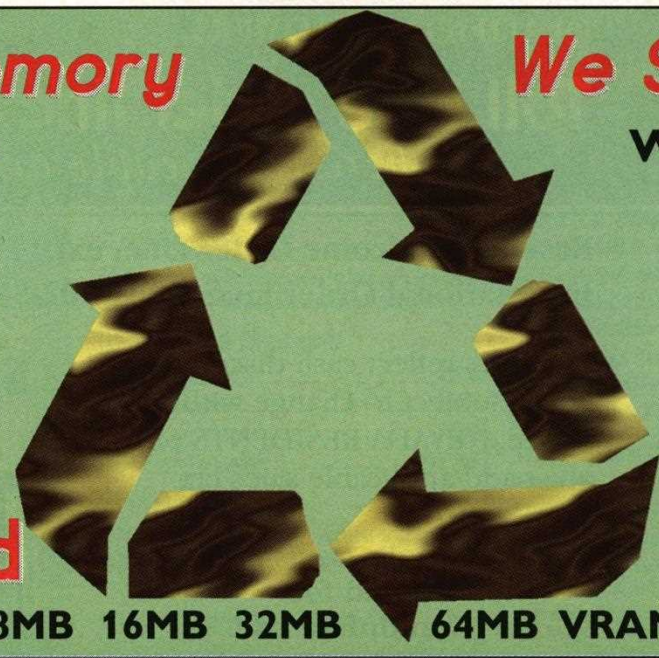

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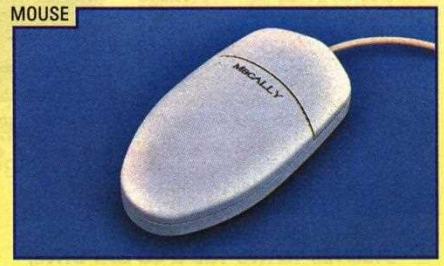

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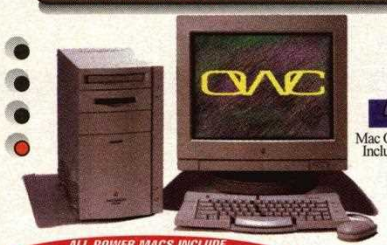

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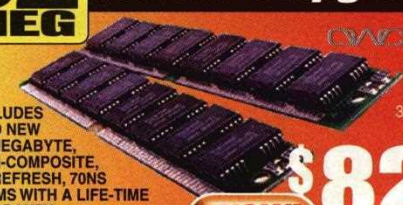

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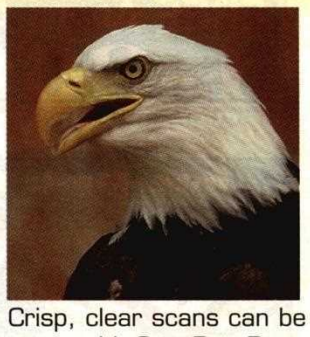

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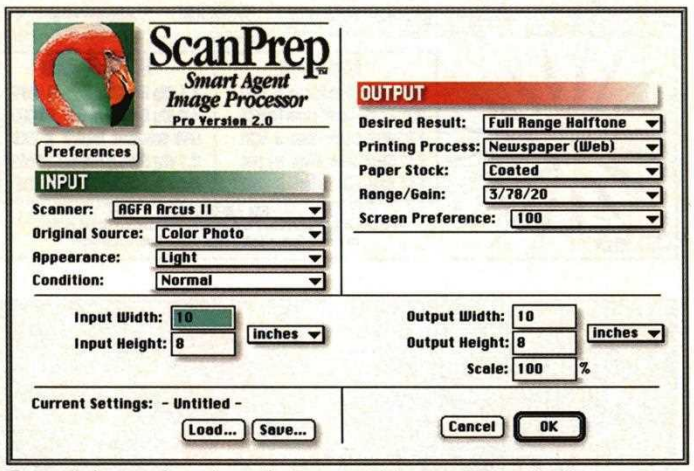

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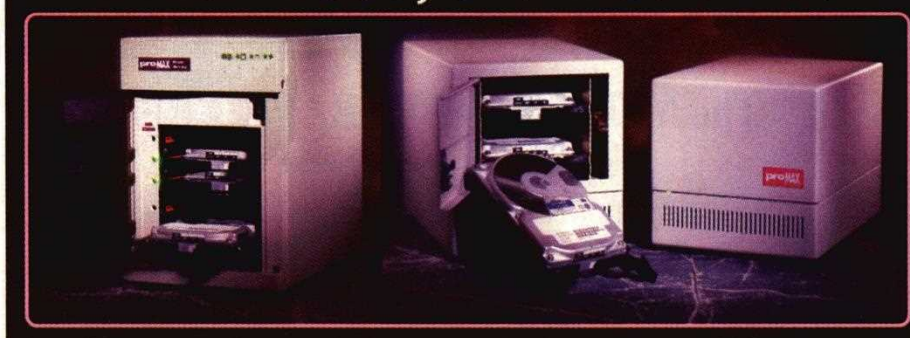

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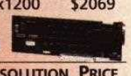

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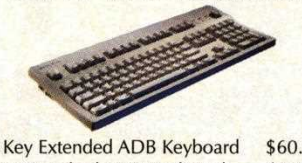

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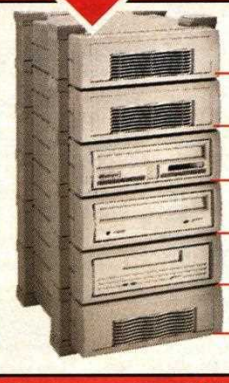

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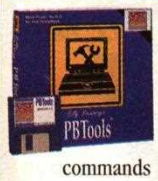

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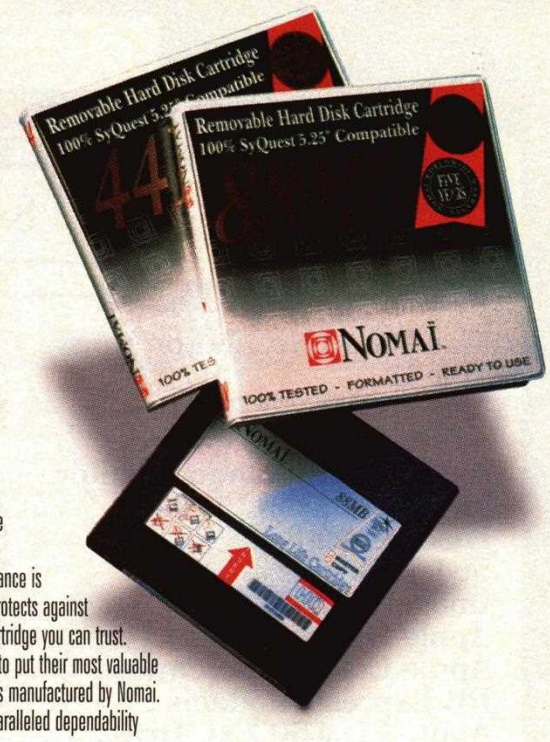

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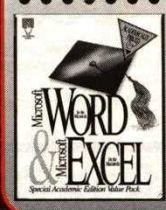

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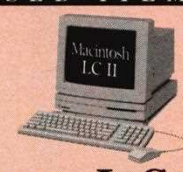

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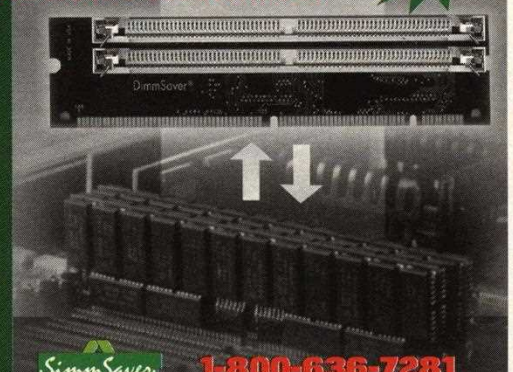

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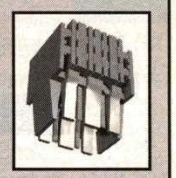

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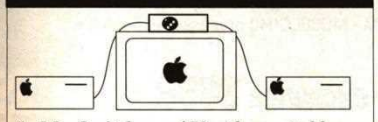

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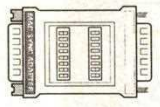

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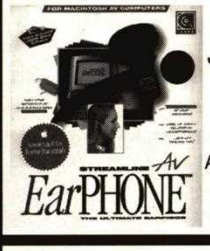

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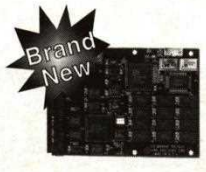

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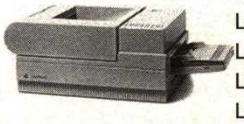

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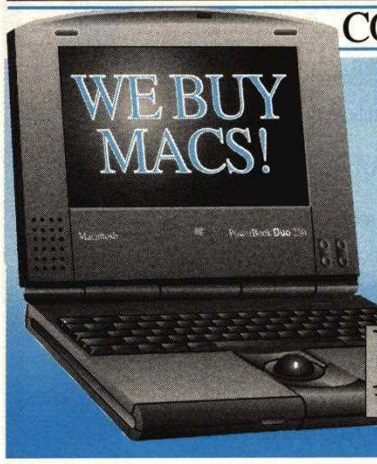

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Tsunami

From Page 1

medical workstation," he said.

Contrary to previous reports, Apple is bundling a single-connector version of the Xclaim GA display card from ATI Technologies Inc. of Thornhill, Ontario, instead of its home-grown PCI board, code-named Surfer (see MacWEEK, Jan. 30, Page 1). Apple was working with its long-time graphics partner, Radius Inc. of Sunnyvale, Calif., to produce Surfer; it may be offered in August with other PCI models, sources said.

Also sure to interest producers of graphical images is Apple's 600-dpi Color LaserWriter 12/600 PS. Offering speeds of 3 and 12 pages per minute for color and black and white, respectively, the printer carries a $6,989 price tag (see Review, Page 1).

Apple said users can expect black-and-white documents to cost 3 cents per page. Business documents that include some color will cost about 13 cents per page; typical desktop publishing jobs will cost about 35 cents per page, the company said.

Color is also the focus of new additions to Apple's inkjet printer line: a higher-resolution StyleWriter 2400 and the portable Color StyleWriter 2200.

The $419 2200 and the $429 2400 both provide 360 by 360 dpi in color and 720 by 360 dpi in monochrome (see MacWEEK, June 12, Page 78). The 2200 has a built-in 30-sheet paper feeder; a nickel-metal-hydride battery pack is $129.

"The 2200 is interesting; it's not just for the mobile user but is great for people who only occasionally print in color," said Larry Jamieson, an analyst with BIS Strategic Decisions of Norwell, Mass. He said the small 2200, which can be stored easily in a desk drawer, will interest business users seeking a secondary color printer to produce presentations and transparencies.

For users wanting black-and-white output, Apple is introducing the LaserWriter 4/600 PS monochrome laser printer. The small, 600-dpi entry-level model is $929. It ships with 2 Mbytes of RAM and uses Adobe compression technology to handle pages with gray-scale images.

The rollout also marks the debut of PrintMonitor 8.0, a major update to Apple's print-management software. The update is available from on-line services, Apple said.

The new version provides most of the printer-management features of QuickDraw GX, including desktop printers and drag-and-drop job swapping among similar printers. It will also deliver some of GX's graphics capabilities, including automatic two- and four-up printing, as well as watermarks. The software will ship with eight watermarks, and users can add others by placing PICT images in the Printing Preferences folder.

Version 8.0 will not work with some third-party QuickDraw printers, Apple said. □

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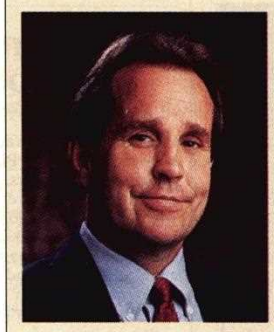
These companies announced their support for the new PowerPC 604-based Power Mac 9500 and their intent to modify their applications to take better advantage of performance capabilities unique to the new processor.

Strickland

From Page 1

learning, embedded systems, enterprise and small business. Although Apple has strengths in many of these areas, Strickland admitted that the company is playing catch-up in others.

"Today we do not have a story that we [can] pull together that satisfies the IS area," he said. Strickland cited network protocols where "there's a lot of fine-tuning that needs to be done before we connect well." He pointed to the deficiencies in Mac OS remote administration and the lack of Microsoft Visual Basic for Macs, which some information systems managers are demanding.



"We're going to admit we don't have [everything] because we have got to get credibility [with IS managers]."

Part of Apple's problem with IS organizations, Strickland said, has been the company's inability to effectively market the products that it and third-party developers already have for the Mac. But he said: "We're also going to admit we don't have [everything] because we have got to get credibility [with IS managers]. We can't lie and say we have everything you need."

Strickland said his biggest challenge was to alter the value-added reseller channel's perspective that pegs Apple as a minor player with a mere 10 percent of the personal computer market. "Apple is everywhere," he said. "In some areas we have a very small presence; in others, we have a very large presence." Strickland claimed only 2 percent of Apple's business came from VARs, as opposed to the industry average of 6 percent.

To induce VARs to sell Macs more aggressively, Strickland proposed that Apple sell a series of predefined system bundles. For example, he said, the company could offer 12 Macs with an AIX server.

Part of the problem signing up VARs has been the lack of general-purpose business applications, such as accounting and human-resources software. If Apple provided these typically non-Mac programs on a preconfigured Power Macintosh with a DOS compatibility card, Strickland said, Mac VARs would get more opportunities to sell into small businesses. Such a bundle would meet the customer's application needs and would not require on-site IS support, he said.

Strickland also suggested Apple might offer users a Mac bundle with the Color LaserWriter 12/600 PS, introduced this week, plus a color monitor with digital photometry that adjusts RGB settings as the screen's phosphorous elements decay. This as-yet-unnamed monitor would have to be calibrated only once, he said.

In the publishing market, one of the Mac's traditional strongholds, Apple is considering a digital authoring system bundle that would give publishers the tools they need, including a Mac-based Internet server, to translate printed content for distribution over the Internet in Adobe Acrobat's Portable Document Format (PDF).

"We [could] provide the capability where you do color desktop publishing on paper [with] a relatively straightforward way of converting your document into a PDF file and publishing that on the Internet," Strickland said.

In the embedded systems area, he said, Apple products currently are used in Honeywell navigation systems built for the U.S. Department of Defense. The company intends to expand that business, particularly in medical diagnostic equipment, he said.

Strickland estimated that these business solution programs will be ready within six to 12 months. He did not comment on when the self-calibrating color monitor would be available. □

Pippin

From Page 1

project in May. Sources said they felt the development schedules set for modifying System 7.1.2 were unrealistic and so, after appealing to superiors for more than a month, they transferred to other projects within Apple. Not all have been replaced, according to sources.

Even before May's personnel upheaval, sources said, the Pippin OS probably could not have been completed until June 1996. The departure of the OS engineers could push the project back even further.

"It's unfortunate," said one person familiar with the project. "At one time, Pippin was considered the project where the best and the brightest software engineers wanted to go. Now Power Computing [Corp.] holds that distinction."

Apple spokeswoman Carolyn Donohoe said: "A small percentage of Pippin engineers have been reassigned. It in no way undermines Apple's commitment to staffing Pippin. Apple and Bandai are working together closely to meet their schedules." She said the project is on track and Apple will begin seeding developers with preproduction Pippins later this summer.

This hardware will loosely approximate second-generation Power Macs, albeit without key components, such as hard or floppy disk drives, and will use a television for eight-bit and 16-bit color display.

Apple said Pippin will comprise a 66-MHz PowerPC 603 processor, 6 Mbytes of RAM, a quadruple-speed CD-ROM, 16-bit in/out stereo sound, standard and GeoPort serial ports, and a childproof ADB port. An internal bus nearly identical to PCI will provide future expansion.

According to Apple's initial announcements, Pippin's controlling software will be a CD-ROM-based subset of the Mac OS and Mac ROMs, optimized for multimedia through the integration of QuickTime but with a reduced memory footprint. Future versions of the Pippin OS might offer other technologies, such as QuickDraw 3D and QuickTime VR, Apple said.

Because it closely approximates a Mac, Pippin will run slightly modified Macintosh applications. Pippin titles will run as-is on the Mac, increasing the likelihood that developers will adopt the new platform, Apple said. According to the company 25 developers, including Redgate Communications and Activision Inc., have committed to developing 75 titles for the new device.

Industry observers said Pippin will compete with a new generation of powerful game machines due this fall and next spring from Nintendo Co. Ltd., Sega Enterprises Corp., Sony Corp. and 3DO Co. The price range for the game machines is expected to start at about $300. Bandai, which also makes titles for other platforms, earlier predicted it will sell at least 500,000 Pippin units in the first year.

Bandai was unavailable for comment. □

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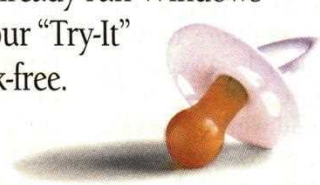

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RSG makes jump to QuickDraw GX

By Carolyn Said

Manhattan Graphics Corp. is now shipping Ready,Set,Go! GX 7.0, an upgrade to the page-layout program that supports the typography and printing features of Apple's QuickDraw GX system extension.

Priced at $395, RSG GX lets users take advantage of GX's ligatures and swash characters and also lets users determine how colors of overlapping elements interact. For example, blue text could turn purple where it overlaps a red circle.

Also, text can now be formatted to run across a curve. RSG GX will allow a single document to contain pages with varying sizes and orientations.

GX printing features include drag-and-drop printing, more control of printer options and the capability to create "print and view" Portable Digital Documents.

RSG GX adds a new tool for creating and manipulating paths made of straight lines or Bezier curves or both. Other changes include enhanced spell checking and find and replace, a new color interface and palette, and support for the Pantone Process Color System.

In addition, the program has added the capability to skew any text from minus 45 to 45 degrees, new dot types for halftone screens, hung punctuation, optical alignment and import filters for current versions of Mac word processors.

RSG GX is available in either 680x0 or Power Mac versions. It requires System 7.1 or later with QuickDraw GX 1.0.1 or later. Upgrades are $69.95 from Version 6, $89.95 from earlier versions. A competitive upgrade from other desktop publishing programs is $149.95.

Manhattan Graphics Corp. of Hartsdale, N.Y., can be reached at (914) 725-2048; (800) 572-6533; fax (914) 725-2450. □

Ready,Set,Go! GX uses QuickDraw GX technology to perform type effects, such as ligatures, diphthongs and swash characters.

Fast Ethernet *From Page 1*

links, such as 100-Mbps Fast Ethernet, according to Hornbuckle.

Nonetheless, several companies plan to debut Fast Ethernet cards this week, and others are readying cards for Fiber Distributed Data Interface and Asynchronous Transfer Mode (see story, Page 16).

Georganne Benesch, director of product marketing for Farallon Computing Inc. of Alameda, Calif., said her company decided to ship its 100BASE T PCI card this week for several reasons. "We know customers want to get going with Fast Ethernet and start trying out Open Transport and PCI," she said. "The other reason is that we made a commitment to Apple to have our card available when the PCI Macs ship."

Farallon said it intends to release in July a Fast Ethernet card for NuBus Macs. Benesch said that although the PCI bus is several times faster than NuBus, Farallon is now seeing better performance with its NuBus Fast Ethernet card than with its PCI card. She said Farallon's Fast Ethernet PCI card with Open Transport 1.0 runs only about two and half times faster than standard Ethernet.

Bruce Stancombe, director of product marketing for Asanté Technologies Inc. of San Jose, Calif., said, "We are not getting what we would like." Stancombe, whose company also contracted with Apple to deliver a Fast Ethernet PCI card at launch time, said Asanté's card, shipping this week with Mac and Intel-standard PC drivers, runs at 62.5 Mbps on a Dell PC. "We are not getting that with Open Transport and the PCI Macs," he said. "My expectation is that we will not see any grandiose speed improvement [with Version 1.0]. We won't see a 10-times speed improvement."

New entrants said they are going ahead with their plans for 100-Mbps Ethernet PCI cards.

Rockwell Networking Systems of Santa Barbara, Calif., plans to ship a $295 Fast Ethernet PCI card this week that will come with Mac OS, Windows NT and Unix drivers.

"The PCI card removes a lot of the hardware bottlenecks," said Tom Caldwell, Rockwell's product marketing manager. "Apple just has to catch up a bit on the software. We expect the same performance with the PCI Macs and Open Transport 1.1 as with Windows NT."

Digital Equipment Corp. of Maynard, Mass., is also preparing a 100BASE T PCI card for the Mac, with plans to ship this summer a $249 board that will run at 10- and 100-Mbps Ethernet rates.

Apple for its part will wait until the end of the year to release its PCI cards, including one for Fast Ethernet. "The first release of Open Transport is really not targeted at the fast networking arena," said Bill Brown, manager of Apple's connectivity products group. "We have decided not to ship the products until they are ready." □

Fast Ethernet cards for PCI Macs

COMPANY	CARD	PRICE	AVAILABLE
Apple	100BASE T	n/a	End of year
Asanté	10/100BASE T	$269	This week
Danya	10/100BASE T	$259	August
Digital	10/100BASE T	$249	Summer
Farallon	10/100BASE T	$249	This week
Rockwell	10/100BASE T	$295	This week

Adaptec eyes PCI Mac card game

By David Morgenstern

Adaptec Inc., the industry's leading producer of SCSI chips, took a step back into the Mac market last week when it acquired Mac RAID software developer Trillium Research Inc.

Founded in 1992, the Hudson, Wis.-based Trillium fetched a price of $3 million and will continue operation as a wholly owned subsidiary of Adaptec. Trillium's Remus and Remus Lite array software are bundled with drives from many storage vendors as well as under private label from APS Technologies Inc., Conner Peripherals Inc., La Cie Ltd. and MicroNet Technology Inc.

"Nothing changes for Remus users; it's business as usual," said Trillium President Dennys Bisogno. Adaptec will handle some of Remus' support and distribution, he said.

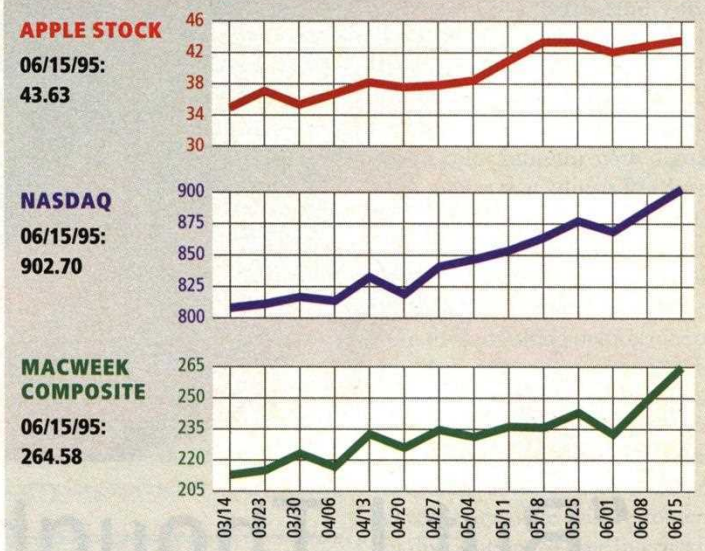
Adaptec said it is committed to current agreements ensuring Remus' compatibility with a number of Mac-based SCSI accelerator cards, including new PCI versions. However, the company said, in the future Trillium technology will be focused on Adaptec projects.

Adaptec said while it has considerable experience with other platforms, it plans to leverage Trillium's experience in developing cards aimed at the Mac. The company said it expects to ship its 1 millionth 2940 SCSI PCI board for Intel-standard PCs this summer. "We realized that although technical talent may be transferable, nothing can compensate for a team of people that have grown up in the Mac market," said Adaptec Vice President John Hamm.

Adaptec said it expects an August release for the Mac version of its AHA-2940W PCI card. The $349 Fast and Wide SCSI-2 card will use a proprietary RISC processor and ship with a Fast SCSI-2 adapter.

Adaptec Inc. of Milpitas, Calif., can be reached at (510) 732-3829 or (800) 959-7274; fax (408) 262-2533. □

StockWatch



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Apple	43.63	1.60
MacWEEK Composite*	264.58	2.67
SOFTWARE DEVELOPERS		
Adobe	59.75	5.75
Caere	9.25	15.63
CE Software	2.81	-5.26
Diehl Graphsoft	4.00	3.23
General Magic	13.88	23.33
Macromedia	39.75	3.92
Microsoft	84.88	0.89
Novell	19.88	-0.63
Oracle	37.38	4.91
Saber	8.88	10.94
Symantec	26.63	4.67
STORAGE		
Conner	12.63	-4.72
Iomega	21.00	-9.68
Maxtor	6.25	2.04
Pinnacle	10.88	10.13
Quantum	23.88	1.60
Seagate	40.00	3.56
SyQuest	13.63	-13.15

	06.15.95 CLOSE	WEEKLY % CHANGE
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Asanté	4.00	3.23
Focus	1.44	0.00
Global Village	15.75	11.50
HP	72.63	3.94
QMS	5.50	-2.22
Radius	12.50	3.09
RasterOps	5.38	16.22
Shiva	44.25	14.94
Tektronix	42.88	-2.00
DISTRIBUTORS		
CompUSA	30.75	11.31
IE	13.25	0.95
Merisel	6.38	4.08
Tech Data	10.75	1.47
INDUSTRY 40.13TORS		
Compaq	40.13	1.26
IBM	93.00	4.20
Intel	115.13	1.15
Motorola	60.50	-0.21
SGI	39.38	3.62
NASDAQ	902.70	1.87

**The MacWEEK Composite is calculated by adding the stock prices of the following companies: Apple, Adobe, Asanté, Caere, CE Software, General Magic, Global Village, Macromedia, Radius, RasterOps, Shiva and SyQuest. Source: Nordby International Inc.*

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JUNE 26

Solutions: E-mail packages with integrated groupware capabilities.

Gateways Extra: What does it take to manage a Web server?

JULY 10

Solutions: For the reliability of RAID storage without the cost, there's RAID software.

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- MicroNet's Master CD Pro
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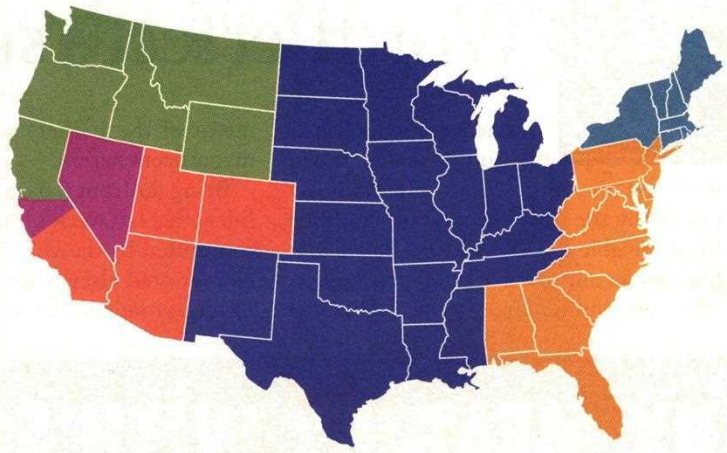

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WordPerfect's suite somethings

If one were so foolish as to judge reality based solely on the impressions left carelessly behind by the popular press, it would be inconceivable to persist in the belief that the people and their elected representatives are intimately familiar with the intent of the Fathers who founded this magnificent nation.

Being far from foolish, the Knife is confident that last week's Internet indiscretion committed by the U.S. Senate will surely be corrected elsewhere in the admittedly tortuous route that ideas must successfully traverse before they become law. But it serves as a reminder that if free speech were without controversy, we wouldn't have to risk stench by association in the ongoing struggle to defeat its adversaries.

And no discussion of adversarial struggles would be complete without at least a passing reference to Microsoft. Some people view that beast as virtually in check by IBM's acquisition of Notes, and this week's rumored announcement by IBM of its intention to license Mac OS for its CHRP machines should help the case.

But now Microsoft must also endure the indignity of a new OpenDoc-based application suite coming from Novell. Scheduled to ship shortly after OpenDoc itself, whenever that might be, this product will represent a poly-affront to Microsoft, challenging both the Microsoft Office juggernaut and its underlying OLE technology and providing Apple and its partners with a dream marketing opportunity.

More marketing

Speaking of Novell, if you're not reading this at PC Expo, you're likely to miss Thursday's keynote address by Ray Noorda. His friends and acquaintances were out in force last week with the breathless news that a new company is to be announced and that it is to be called Canopy Technologies. As usual in these affairs, it was left to the Knife to dig up the details that make the item.

Those excavations in the heart of the rumor pit revealed that Canopy exists to make money from investing in small companies in possession of technologies with product promise. Canopy will also handle distribution and marketing in many cases. Cross-platformism is deemed of paramount importance, and for Canopy-distributed products, that will mean OpenDoc in many cases. More good news for Apple.

Speed watch

Those hot Power Mac 9500 machines haven't even hit the channels yet and already lucky Apple engineers are Macing it up in the lab with models clocked as high as 150 MHz. Major developers who've been given the fast Tsunami treatment would probably agree with the Knife's observation that an incremental speed increase for a machine that already screams is just another step in the right direction. Now if those pesky rumors that the new PowerBooks are to be delayed until October would cease, all would be right with new Apple CPUs.

Salute it

The Senate's inability to grasp the fundamentals has been matched only by our collective ignorance of the System 7.5.2 Secret About Box Easter Egg, judging by the increase in mail traffic whenever the Knife drops a casual reference to it.

So if you think we're talking about you, listen up: Type Secret About Box in a document in any drag-and-drop-capable applications — SimpleText will suffice — then drag it to the Finder desktop. And, no, you haven't seen this one before. □

You don't need a weather forecaster to know which way the wind blows, much less get a MacWEEK mug, just the courage to match the Knife, tip for mug, at (415) 243-3544, fax (415) 243-3651, Internet (mac_the_knife@macweek.ziff.com), AppleLink (MacWEEK) or CompuServe/ZiffNet/Mac.

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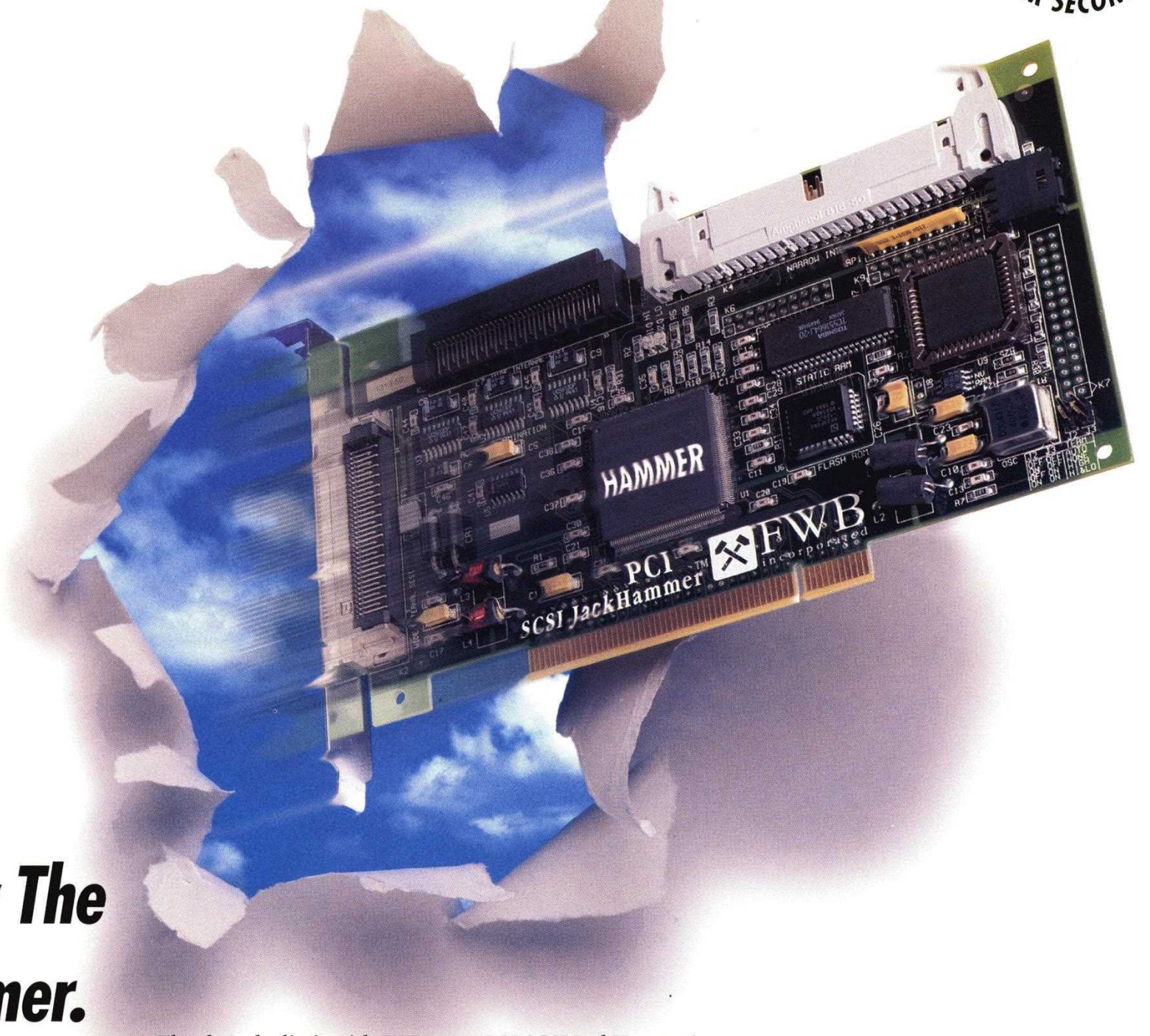

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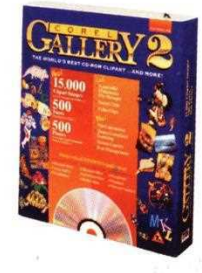

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